

# Psychological and physiological childbirth related variables affecting pain of labour

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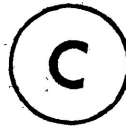
PSYCHOLOGICAL AND PHYSIOLOGICAL CHILDBIRTH RELATED  
VARIABLES AFFECTING PAIN OF LABOUR

MA THESIS

FEBRUARY, 1982

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## Abstract

Both labour pain, and pain in general, have been researched extensively. Many variables have been found to influence the individual's pain response. We now know that childbirth related variables (both psychological, e.g., prenatal preparation, and physiological, e.g., medication) correlate with degree of labour pain felt. However, we do not know if these are the variables which affect the pain or if there is another variable mediating this correlation. It may well be that there is a selection process operating here whereby only certain women elect to attend a prenatal class and/or have their husbands present; possibly they would have had less pain even without these preparations. This seems to be an important issue since a lot of time and effort is expended on these courses. In addition, in light of recent findings concerning the negative effects of medication on the infant, it is important to determine to what extent it alleviates pain in order to justify its use.

Therefore, this study simultaneously examined several variables in order to determine the unique contribution of psychological childbirth related variables to labour pain, over and above that of other variables (e.g., trait, demographic and physiological childbirth related variables). In addition, the differing contributions of non-psychological childbirth related variables, demographic variables,

and trait variables were assessed. Finally, the total variability in labour pain explained by all the variables chosen for measurement was examined and individual variables were checked for significant correlations. The subjects used in this study were 116 primigravida women who delivered at one of 13 Metro Toronto hospitals. The study assessed the degree of labour pain according to subjective reports.

The scales measuring the pain were: (a) Judgments of pain along a 10 cm line--on one end was written: "no pain at all", and on the other end: "my pain is as bad as it could possibly be". (b) Judgments of pain along a five point scale (very severe pain, severe pain, average pain, mild pain, very mild pain). (c) The McGill Pain Questionnaire. A questionnaire tapping other variables was administered in two parts, one in the third trimester of pregnancy, and the other one to five days after delivery. The questionnaire contained scales measuring: (a) Psychological childbirth related variables (e.g., attitude to pregnancy and child, amount of prenatal preparation). (b) Physiological childbirth related variables (e.g., amount of medication received, labour length). (c) Trait variables (e.g., locus of control, anxiety). (d) Demographic variables (e.g., socioeconomic status, cultural group). A hierarchical multiple regression was carried out in an attempt to answer the questions

about variability related to pain which were described above.

The variables used in this study were found to correlate with the affective component of the McGill Pain Questionnaire better than with any other pain variable.

The demographic variables set had the lowest correlations with pain, while the psychological childbirth variables set had the highest correlations. Of the 24 variables examined only eight did not correlate significantly with the pain of labour. Presence of father and medication, although expected to correlate negatively with pain, correlated positively with pain. Applications of this research and possible explanations for the results were offered as well as suggestions for future research.

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## Psychological and Physiological Childbirth Related Variables Affecting Pain of Labour

Many studies have been done on pain in general, and a host of variables have often been found to influence such pain. In addition, many pain reduction techniques have been examined (relaxation, medication, cognitive control strategies, etc.), and some have been found to be effective. Fewer studies have been done on pain in labour. In this area pain reduction has been sought in drugs (anaesthesia and analgesia), husband participation in childbirth, and in theoretical instructions, exercises, relaxation, or postures taught in prenatal classes (Lamaze, Grantly Dick-Read, etc.). It is difficult to draw conclusions from the studies in this area since the results are often contradictory.

The present investigation utilized a naturalistic observation technique (correlational design) in which a variety of measures were collected, together with ratings of pain of labour. While this design does not permit direct inference about cause and effect (for which a true experiment with random assignment would be required), through the use of multiple regression techniques a number of specific questions can be answered. Variables which might affect pain of labour were categorized into four sets. The first set of variables--Psychological childbirth related variables, were measures of factors which might affect the psychological preparation of the

woman. Variables in this set are ones that can be changed through childbirth preparation, and the primary goal of this investigation is to identify which, if any, psychological variables are related to pain of labour. The second set of variables--Physiological childbirth related variables, were factors specific to the birth itself, e.g. medication, size of baby. The last two sets--Demographic variables and Trait variables are measures of relatively permanent characteristics of the woman. By entering these sets of variables sequentially into the regression equation (demographic, trait, physiological childbirth, psychological childbirth), the contribution of each set of variables to explaining pain of labour not accounted for by previously entered sets can be determined.

Trait and demographic variables might influence the pain directly or indirectly by influencing a third variable which then influences pain. For example, women who have an internal locus of control (a trait variable) may choose to participate in childbirth courses (a psychological childbirth variable) more often than women who have an external locus of control. The technique of multiple regression is the most suitable to separate these influences.

#### The Nature of Pain (Underlying Mechanisms)

Attempts to understand the neurological basis of pain have not been as successful as attempts at understanding other perceptions. Pain is unique in that it

has a motivating or reactive aspect, as well as affective and sensory aspects (Weisenberg, 1977; Melzack, 1973). Pain motivates us to do something concrete: go to a doctor, utilize a cognitive strategy or even just grin and bear it, but we always actively react to it. Pain is affected by situation, suggestion, expectation, and a host of other variables. For example, it has been reported (Beecher, 1956) that during World War II wounded American soldiers taken to the hospital reported feeling little or no pain, so they did not require medication. Yet, their capacity for feeling pain was fully intact since they complained as much as anyone else about an inept vein puncture. Civilians reported feeling much more pain while undergoing operations for comparable wounds. The explanation given is that psychological factors (i.e., the soldiers were actually happy that they were wounded since this enabled them to escape the war), greatly affected the perception of pain.

Three major attempts have been made to explain the neurological basis for pain: the Specificity theory, the Pattern theory, and the Gate Control theory.

The Specificity theory (Mountcastle, 1974, cited in Weisenberg, 1977) states that specific types of nerve fibers serve as pain receptors (A-delta and C-fibers) i.e., a specific receptor lies beneath each sensory spot on the skin and impulses from these fibers are necessary and sufficient for feeling pain. This means that the

psychological experience of pain has a direct one-to-one relationship with these receptors (i.e., the receptors will always elicit pain if stimulated with enough intensity, and only pain will be felt). Research has established the existence of these fibers, however research has not yet determined the nature, location and interaction of the predicted specific higher centers in the process of leading to the perception of pain once these fibers are stimulated (Weisenberg, 1977).

The Pattern theory sees pain as based on stimulus intensity and central summation. Pain is seen as an excess in stimulation of any kind. It is a spatial and temporal summation of all types of input, i.e., there is no specialization of receptors (Crue and Carregal, 1975, cited in Weisenberg, 1977).

The Gate Control theory contains elements of both the former theories. There is specialization in receptor sites which is similar to the Specificity theory. As for the Pattern theory, a gate mechanism operating in the substantia gelatinosa in the dorsal spine is opened and closed by nerve impulses. Large diameter fibers (A-beta) close the gate, and small diameter fibers (A-delta and C) open it, and activate T-cell activity once a critical level is reached. When the gate is open, there is synaptic transmission to centrally projecting T-cells, and when it is closed, there is no such transmission. Melzack's unique contribution is in stating that psycho-

logical input can also open and close the gate (Melzack, 1973). Thus, pain is more than just the product of specific receptor site stimulation, akin to Pattern theory.

Each of the above theories has been contradicted by theory and research. The proponents of the Specificity theory have not succeeded in finding a pain centre in the brain. In addition, they make unwarranted assumptions. One assumption is anatomical and it states that a single specific receptor lies beneath each skin area. This is not true as there are a variety of such receptors in any given area (Melzack, 1973). The second assumption is psychological. Specificity theory maintains that each psychological dimension of somaesthetic experience has a direct relation to one stimulus dimension and to a given type of skin receptor, i.e., that the specific receptor will always elicit pain when simulated and only pain will be felt. However, Melzack (1973) points out that the assumption of a one-to-one relationship between pain perception and intensity of the stimulus is not borne out by psychological evidence. Rather, the amount and quality of the pain perceived are determined by many psychological variables in addition to sensory input. As for the Pattern theory--it does not take into account the physiological findings which show clearly that there is some specialization in receptor sites. For example, researchers have discovered what are called A-delta and C-fibers, which only react to certain types and ranges

of stimulation, and when stimulated, the resulting sensation is pain. In regard to the Gate Control theory, studies have failed to find differential effects of A and C fibers. Both produced depolarization (i.e., inhibition), and therefore it is not possible for one type to open and for the other to close the gate (Franz and Iggo, 1968; Vykluky, Rudomin, Zajal and Benke, 1969; Zimmerman, 1968). Moreover, in Friedrick's ataxia where there are less large diameter fibers than are normally present, there is no neuropathic pain. Finally, patients with amyloidosis, characterized by a decrease of A-delta and C-fibers potentials, have pain nevertheless.

A major failing of the first two neurological models (Specificity and Pattern theories) is that they fail to explain how our cognitions and emotions affect the feeling of pain. In contrast, Melzack's Gate Control theory, although resting on a weak neurological basis, does take into consideration the effects of psychological variables on the pain experience by suggesting that these variables can open or close the gate and thus cause different pain experiences with similar stimuli.

The review of the theories has shown that the puzzle--what is pain--has not been fully resolved at a theoretical level. On the practical level an important consideration in pain studies is how to measure the pain. Since we have seen that pain is not like other sensations, especially because it has a motivational factor and is considerably



influenced by psychological and situational variables, there are a variety of possible measures.

### Measurement of Pain

Before measuring pain, it is important to decide which aspect of pain to measure. If the pain is laboratory induced, then one may measure pain threshold (the lowest level that is termed painful), pain tolerance (the highest level a person can tolerate), or pain sensitivity range (the range between threshold and tolerance). In addition, in laboratory research the nature of the pain stimulus is important. Studies have shown that different pain stimuli may not create the same effects. Davidson and McDougall (1969) cite various experiments in which the correlation between different pain eliciting stimuli was either very low (0.57 in Chapman and Jones, 1964) or not at all significant (Stengel, Oldham and Ehrenberg, 1963). Davidson and McDougall (1969) compared four different stimuli: cold pressure, pressure algometer (pressure was applied to the thumb at the rate of 1 kg/sec), shock, and radiant heat. The correlations between them were very low and most correlations were not significant at all.

In clinical research where the pain stimulus is not experimentally manipulated, the question of how to measure the pain remains important. One method is to have the subject change the level of a painful stimulus until it matches the level of his clinical pain. This

method has been used by Hardy, Wolf, and Goodell (1952) with heat, and by Peck (1967) with intensity of a tone. Beecher (1959, 1963) proposed to assess pain by checking the amount of analgesics a person needs in order to lessen the pain. However, this may not be an accurate measurement since Bond (1973) found that among patients in pain, those with a higher extroversion score requested analgesics, while those with a lower score, although in pain, requested no analgesics.

The preferred method of measuring pain is with subjective measures. Mersky and Spear (1967) believe that a subjective experience must be measured by a subjective measuring device in the same manner as we measure length by a device that has extension. Therefore, pain may be assessed by asking patients to rate their pain on a 10 cm line (after Clarke and Spear, 1964; Aitken, 1969), by using a scale (no pain, mild, etc.), or with a specially designed questionnaire, (e.g., Melzack's McGill Pain Questionnaire, Melzack, 1975). Woodforde and Mersky (1972) found a high correlation between ratings of pain on a 10 cm line (they wrote at one end "no pain at all", on the other end "my pain is as bad as it could possibly be"), ratings of pain on a five point scale (no pain, mild, quite a lot, very bad, unbearable), and the amount of pain found by matching the intensity of a tone to the pain (i.e., an audiometer). Brown, Fader, and Barber (1973) also found consistency among three kinds

of pain ratings: threshold, tolerance, and subjective ratings. However, Grimm and Kanfer (1976) found a very low correlation between tolerance, which was measured by duration of time the hand was kept in cold water, and self-report on a 1(mildly unpleasant) to 8(absolutely intolerable) point scale. After the subjects participated in the procedure which involved immersing their hand in cold water, receiving control measures or expectations about the pain and putting their hand again in cold water, the rating scale was given. It should be noted that the lack of correlation may be due to the fact that the second trial may have affected the rating of the first. This notion is substantiated by the finding that the mean rating of the first trial differed between groups (i.e., groups that experienced more pain reduction rated the pain of the first stage as less).

Melzack (1973) addressed himself to the problem of the multidimensionality of pain. He stated that the current pain measurement methods deal only with the intensity of pain. This is like dealing with the visual world exclusively in terms of light flux. Instead, Melzack views the word "pain" as a linguistic label that categorizes an endless variety of qualities. Melzack and Torgerson (1971) gave subjects words describing pain and asked them to classify the words into smaller groups (i.e., three major classes of words and 13 subclasses). Some agreement was reached among doctors, patients, and

students on the positions of the words relative to each other (on an intensity scale), within each category (major class). From this Melzack developed a questionnaire to determine the properties of different pain syndromes. Melzack and Torgerson (1971) categorize the "pain words" into three major classes: (a) sensory qualities--temporal, spatial, pressure, thermal, and other dimensions; (b) affective qualities--tension, fear, and autonomic properties; (c) evaluative words--describing the subjective overall intensity of the total experience of pain (e.g., agonizing, annoying).

Tursky (1975), has also developed a multidimensional measure of pain in which the dimensions are similar to Melzack's. This adds credibility to the dimensions. Tursky used verbal magnitude estimation procedures and ended up with three different scales which answer the questions: (a) "How much does the pain hurt?" (i.e., intensity); (b) "How unpleasant does the pain feel?" (i.e., unpleasantness); (c) "What does the pain feel like?" (i.e., evaluation). The three dimensions mentioned by both Melzack and Tursky sound like similar ones typically found in studies of dimensions of emotions in general (e.g., intensity-activation, affective-hedonic tone, cognitive-evaluation, Ricciutti, 1968).

In pain of labour studies, the pain measures used were mostly subjective rating scales filled out by the woman after birth, of three points (Bergstrom-Walan, 1963;

Davenport, Slack and Boylan, 1974); five points (Cogan, Henneborn, & Klopfer, 1976; Winsberg & Greenlick, 1967); six points (Klopfer, Cogan, & Henneborn, 1975); or seven points (Klusman, 1975). Some studies (Davenport-Slack & Boylan, 1974; Klusman, 1975; Nettlebladt, Fagerstrom, & Uddenberg, 1976) referred only to pain of one stage of labour or the general overall pain of labour, and some (Klopfer, Cogan, & Henneborn, 1975; Cogan, Henneborn, & Klopfer, 1976) used separate measures of different stages of labour. Javert and Hardy (1951) used a different pain measure involving varying pain of thermal radiation until it matched the woman's pain of labour. These studies dealt only with the intensity of the pain and not with other dimensions of the experience (i.e., evaluative, affective, sensory).

#### Variables Related to Pain of Labour

Only 12 studies relevant to the question of factors affecting labour pain have been performed. Of these, 11 are directly concerned with this question, while one (Zuckerman, Nurnberger, Gardiner, Vandveer, Barrett, & DenBreeijen, 1963) has supplementary data relating to it since it measured the amount of medication as a dependent variable, assuming this to be applicable to pain. Ten studies used a correlational design and only two used an experimental design. One study (Javert & Hardy, 1951) manipulated combinations of analgesia. However, since only one woman was given each combination, no tests for

significance were performed. The other study manipulated prenatal preparation and found it effective in reducing pain of labour. The subject pool on the 12 studies generally consisted of 27-681 multi and primiparas (i.e., not only first pregnancy women), with an age range of 16 to 36 years, and an average age range of 23 to 26 years. The education range in the studies covers below high school up to college education. All socioeconomic levels were used. Of these studies 11 used subjective pain ratings by the woman and/or her doctor or childbirth educator, while one (Javert & Hardy, 1951) used a device comparing the pain of labour to the pain of thermal radiation. The most comprehensive set of pain measures were used by Norr, Block, Charles, Meyering, and Meyers (1977) who used eight indices, and the least comprehensive were Nettlebladt et al. (1976) who rated pain on a three point scale. The average number of variables studied per investigation was seven, with the range of 1 to 21. The most comprehensive study was by Norr et al. (1977) who used eight sets of variables composed of over 20 variables in a heirarchical multiple regression analysis, while the least comprehensive was performed by Cogan (1975) who used only parity as an independent variable. The findings of these studies are presented below, with the variables categorized into four sets.

Psychological childbirth related variables.

1. Type of and amount of prenatal preparation.

In these classes the women receive theoretical information and training in exercises, relaxation, or postures. The effect of participation in the classes may be seen as the influence of amount of control over the situation provided by the exercises and relaxation. Stevens and Heide (1977) studied attention focusing combined with a systematic feedback relaxation technique which they claim resembles childbirth techniques. They found that this combination decreased subjects' pain experience and increased pain endurance more than either technique alone. They conclude that childbirth techniques have an analgesic effect. An additional factor relevant to prenatal classes is that they reduce anxiety. Cooper and Cento (1977) found that conducting a group where Hispanic patients could talk freely about their fears, learn about labour and delivery, clear up misconceptions and gain emotional support, resulted in less anxiety and "hysteria" during labour. It is unclear, however, if amount of practice of the techniques taught in prenatal classes is important. Cogan et al. (1976) found that increased practice resulted in more pain, possibly because it stemmed from more anxiety. However, Stevens and Heide (1977) found that the pain reduction increased with more practice of their focusing relaxation technique, and therefore concluded that amount of practice is an

important variable. In Stevens and Heide's study, subjects were told how much to practice the technique, whereas in Cogan et al.'s study, subjects practiced according to their wishes. This may be the reason for the conflicting finding. Norr et al. (1977) found Lamaze preparation to reduce pain significantly, however, Davenport-Slack and Boylan (1974) and Klusman (1975) did not find this variable significant. Bergstrom-Walan (1963) found the Grantly Dick-Read method significantly reduced pain of labour and Cogan et al. (1976) found the general preparation method effective in reducing pain of labour. However, Nettlebladt et al. (1976) found this variable did not reduce pain significantly.

2. Doctor-patient rapport and hospital situation. This variable relates to the amount of help, guidance and support given to the woman by the nurses and by the doctor. This can have a positive effect by providing moral support, reassurance and specific help in pain control, or have a negative effect by increasing fear and anxiety, undermining faith in the pain oriented exercises, etc. According to Norr et al. (1977) this variable had no significant effect in reducing pain of labour.

3. Fears for self, fears for baby, lack of desire for pregnancy. All these fears and anxieties are expected to make the pain greater since they may cause muscle tension. Norr et al. (1977) examined pregnancy experience



which included worry about birth, but this variable did not correlate significantly with increased pain. However, Nettlebladt et al. (1976) examined anxiety about pain in birth and found a significant correlation with pain. Grantly Dick-Read (1955) explains that the circular muscles of the womb should be loose and relaxed when the long muscles contract to push the baby out. However, due to anxiety these muscles may not loosen and thus they may work against the long muscles causing pain. He sees this as the woman's unconscious resistance to childbirth and the cause of nearly all the pain in labour. The prenatal classes may reduce fears for self and baby by giving proper information.

4. Presence of father. This variable relates to the father's help in coaching the woman in breathing correctly and providing moral support. Some studies used a similar variable--if the woman wanted the baby's father present or not. The fathers presence was expected to reduce anxiety and thus reduce pain by giving encouragement. In addition, the husband may act as a coach and remind the woman about breathing, relaxation, etc., which should help alleviate the pain. Huttel, Mitchell, Fischer and Meyer (1972) found that fathers' presence made the childbirth experience more positive for the women (i.e., they were less tense, according to physical reactions), and Cogan et al. (1976) found a relatively large negative correlation between presence

of father and pain of labour. However, Nettlebladt et al. (1976) and Norr et al. (1977) used this variable and did not find a significant correlation with pain. Davenport-Slack and Boylan (1974) did not find a significant correlation between wanting husband present and pain of labour.

5. Amount of information about what to expect and amount of pain expected. These variables were not used in previous pain of labour research. However, they were expected to affect pain of labour in a way similar to that in which they affect pain in general, by providing the woman with something to compare her pain to. Staub and Kellett (1972) found that information about the shocks and the manner of delivery raised the tolerance to the shocks.

6. Attitude to pregnancy and motherhood. This includes such questions as: "Was the pregnancy planned?", "Does the woman want more children?", "How well was she during the pregnancy?", etc. This variable was used differently in each study. It is generally assumed to correlate with pain, since women whose attitude is more negative will be less likely to talk about and prepare for the upcoming event and seek information through classes (actions that may reduce anxiety). In addition, women are more likely to tolerate higher levels of pain when the baby is wanted, compared to when the baby is not wanted. Davenport-Slack and Boylan (1976) did not

find a correlation between pain and attitude to birth. Zuckerman et al. (1963) reported that psychological reaction to pregnancy (measured by average somatic symptoms complaint) did not correlate significantly with pain as measured by amount of analgesics needed. Although Norr et al. (1977) failed to find a significant correlation between attitude to pregnancy and motherhood and pain, Nettlebladt et al. (1976) did find this correlation significant.

7. Medication expectation. This is the amount of medication the mother expects to receive in labour and delivery. Davenport-Slack and Boylan (1974) do not explain why it should be significant, but perhaps this expectation indicates the woman's level of anxiety, or if it varies from the amount received, may cause anxiety. However, they did not find a significant correlation with pain.

8. Skill of panting, breathing correctly (defined by the childbirth educator). These are all techniques designed to help the woman reduce her pain by helping her body go through the stages of labour and therefore the more skillful the woman is at them, the less pain she is expected to have. Norr et al. (1977) failed to find a significant correlation between use of patterned breathing and pain. Cogan et al. (1976) found a negative correlation between skill at panting and pain of labour but did not test for significance.

Physiological childbirth related variables.

1. Levels of anaesthesia and analgesia. Drugs affect pain of labour in the same manner as they affect pain in general, i.e., by working on the receptors and thus lessening the sensation of pain (analgesics), or by blocking the knowledge of pain from entering the brain, or changing the brain's response to the sensory input (anaesthetics). According to Javert and Hardy (1951), the analgesics reduce uterine activity by acting on the nervous system and they also relieve anxiety. They found Morphine, Scopolamine and Heroin to be effective in pain reduction and Demerol to be ineffective. Norr et al. (1977) found a positive correlation between analgesics in labour and pain, and Klusman (1975) found anaesthesia to significantly reduce pain of labour. However, Nettlebladt et al. (1976) used both analgesia and anaesthesia and did not find this correlation significant.

Another aspect of medication is the long term damaging effects of such drugs on the baby's development. Standley, Soule, Copans and Duchowny (1974) found that various analgesics administered during labour and anaesthetics administered during delivery, affect the newborn's behaviour, e.g., his alertness, irritability and motor maturity. The use of anaesthesia has a greater influence on the infant than analgesics. However, Lester, Emory and Hoffman (1976) found that other factors (age of mother, birth weight of baby, etc.) rather than medication,

correlated with the infant's behaviour (according to the Brazelton scale). They explained that studies that found a parallel with medication, which may really not exist, found so because they did not control for these factors. However, Lester et al.'s sample size was small, and, moreover, they did not have information on dosage levels and time of medication, which other studies (e.g., Standley et al., 1974) used. Consequently, their study should only be considered as exploratory. Therefore there is still no answer to this question of the effect of medication on the newborn.

2. Complications of labour. Complications during labour (e.g., slow dilation after active labour has begun), can increase anxiety and thus increase pain. Further, the complications themselves may cause pain. Norr et al. (1977) did not find a significant correlation with pain.

3. Length of labour, and of second stage. A long labour or a long second stage (the stage where the baby is coming out), increases fatigue and frustration as well as the duration of the pain, and this could increase the subjective evaluation of pain. Nettlebladt et al. (1976) used this variable but did not find a significant correlation with pain.

4. Difficulty in delivery. Difficulties in delivery (e.g., a knot in the cord) can cause more pain by themselves and also by necessitating the use of various procedures which may be painful (e.g., forceps delivery).

Norr et al. (1977) did not find this variable to correlate significantly with pain. Klopfer et al. (1975) assumed that the use of an episiotomy (a cut made in the periperum before birth to avoid a tear) or forceps ( a metal instrument used to help the baby out) indicate trouble with the birth and result in a more painful delivery. However, they did not find a significant correlation between either forceps or episiotomies and pain of labour.

5. Birth weight of baby. The heavier the baby, the more pressure it may exert on the cervix, and this may result in more pain. Nettlebladt et al. (1976) used this variable but did not find it to correlate significantly with pain of labour.

6. Head circumference of baby. Nettlebladt et al. (1976), who examined this variable do not explain why it should be significant. Possibly the larger the head, the more pressure it may exert and therefore induce more pain. Nettlebladt et al. (1976) failed to find a significant correlation between this variable and pain.

7. Rupture of the membranes. In some cases the sac of water enclosing the baby breaks before or during labour. Nettlebladt et al. (1976), who examined this variable did not explain why it should correlate with pain, and did not find this correlation in their research.

8. Parity. This is the number of previous births the woman has had. The first birth is always found to be the most painful, since in the following births the

woman has more information about what to expect, her labour is shorter, the contractions are more efficient, and in general her body is more prepared for birth. Davenport-Slack and Boylan (1974), Cogan et al. (1976) and Norr et al. (1977) did not find a significant correlation with this variable. Winsberg and Greenlick (1967) found a correlation but failed to test for significance and Cogan (1975) found multiparas to experience less pain than primiparas in all stages except during transition.

#### Trait variables.

1. Anxiety. This is an unpleasurable affect consisting of psychophysiological changes in response to an unreal threat (Freedman, Kaplan, & Sadeck, 1976). High anxiety was expected to correlate with lower pain tolerance. However, exactly how anxiety affects the sensation of pain is unknown. Perhaps it can cause muscle tension in labour and childbirth. Bobey and Davidson (1970) found that relaxation was very effective in reducing anxiety and thus helping the person cope with laboratory pain. The authors quote a large number of studies finding that lesser anxiety in psychiatric cases is related to higher pain tolerance and that lesser anxiety in surgery reduces amount of narcotics needed to cope with post-operative pain. In addition, Mersky (1965) found that persistent psychogenic pain is associated with anxiety. Tursky (1974) cites a study that found that threatening instructions concerning the electrical stimulus (which

supposedly increased anxiety) produced a 25% increase in magnitude estimates of standard pain stimuli compared to a group given reassuring instructions. Using amount of analgesics given as their pain measure Zuckerman et al. (1963) found a significant correlation with pain using the Zuckerman anxiety scale but not with the Taylor manifest anxiety scale. Klusman (1975) also found a significant correlation between anxiety and pain of labour.

In contrast to the above studies, Brown et al. (1973) found that responsiveness to pain did not relate to anxiety. However, they used two kinds of pain which are unlike "real life pain" (extreme pain applied to a link and continuous pain applied to a digit). These pain stimuli probably do not induce anxiety, or at least high levels of anxiety, since they do not manage to simulate a "real life" situation.

2. General reaction to pain. It seems reasonable to assume that reactions to labour pain share some common characteristics with general pain experience, and therefore an analogy between general reaction to pain and pain of labour may be expected. However, Davenport-Slack and Boylan (1974) did not find such a correlation.

3. Extroversion-Introversion. Extroverts are impulsive, uninhibited and very sociable; introverts are quiet and fond of books rather than people. Extroverts also produce reactive inhibition faster and stronger than introverts and therefore they show more inhibition to



continued stimulation. This can cause higher tolerance levels. In addition, introverts operate at a higher level of excitation and therefore their threshold would be lower. On the other hand extroverts tend to voice their complaints more readily than introverts, and this may increase their subjective ratings of pain. Eysenck (1961) found a significant correlation between extroversion and pain of labour. Schalling (1971) found that introverts had lower pain threshold and tolerance than extroverts when exposed to noxious electrical stimulation. Lynn and Eysenck (1961) also found the above relation between pain and extroversion-introversion when using radiant heat pain tolerance. Haslam (1972), using the Hardy-Wolff radiant heat apparatus found that the main pain threshold for introverts was significantly lower than that of extroverts. On the other hand, Bond (1973), in exploring the relation between pain in cancer and extroversion-introversion found no such correlation. However, extroverts when in pain asked for analgesics, while introverts in pain did not. The opposite was found by Johnson et al. (1971)--introverted patients took more analgesics than extroverted ones. Mersky (1972) also failed to find a correlation between pain in patients with an organic lesion and extroversion-introversion. Leon (1974), in a laboratory study, found the anticipated correlation in males but not in females. Brown et al. (1973) have also failed to find a connection between

extroversion and pain. Although there are studies both for and against the predicted finding, Barnes (1975) found that in probability pooling (grouping comparable studies and carrying out overall tests of significance), extroverts have higher pain tolerance and threshold than introverts. The balance thus leans toward the conclusion that extroversion-introversion correlates with pain in that extroverts have higher pain threshold and tolerance than introverts, as well as subjectively rating their pain as more unbearable.

4. Locus of control, fate control. In general this is the degree to which the individual perceives that the reward follows from or is contingent upon her own behaviour attributes versus the degree to which she feels the reward is controlled by forces outside of herself (Lefcourt, 1976). Specifically it is the amount of control the woman feels she has over her fate. The control of termination of aversive stimulus diminishes its impact perhaps by eliminating the fear that things can get worse and even beyond endurance. People who feel they control their lives should be better able to control their labour discomforts, seek coping mechanisms to deal with their pain and elicit responses to their needs from the people around them. Therefore they will suffer less pain. Norr et al. (1977) used this variable and did not find it to correlate significantly with pain.

The concept of locus of control is closely tied to the concept of amount of control a person has in a certain situation. The difference is that the amount of control is a more external and objective variable which the experimenter can manipulate, while locus of control is an internal and subjective variable which cannot be influenced as readily. Craig and Best (1977) investigated the influence of locus of control and perceived situational control (influenced by instructions emphasizing personal or environmental determinants of pain) on pain tolerance, to electric shock. They found that internals manifested greater pain tolerance, but the instructions had no influence over pain tolerance.

Grimm and Kanfer (1976) showed that giving patients a feeling of control over their pain (progressive relaxation or imagery incompatible with pain) significantly changed ratings on discomfort scales and changed heart rates during the pain.

Davison and Valins (1969, cited in Weisenberg, 1977) found that when subjects were given a placebo and then retested with the shock level reduced, those told the drug was a placebo (therefore attributing the behaviour change to themselves) had higher tolerance levels than those who were not told (and therefore attributed the behaviour to the drug). Attribution theory can be applied to explain such pain differences. People seek explanations for events that happen to them. Thus when subjects

assume that the changes in pain tolerance are attributable to their own efforts, pain tolerance can be increased.

Tursky (1974) cites studies which found that giving subjects simple control (over onset, intensity, and time between shocks) did not change their tolerance of pain. However, when given high control, there were differences between them and a control group in terms of pain tolerance. In addition, relinquishing of control reduced their tolerance levels. Kanfer and Seidner (1973) found that giving subjects a controlling response (advancing slides of travel pictures), raised pain tolerance over a group denied such control. In conclusion, the data indicates that perceived control reduces pain, therefore people with an internal locus of control should experience less pain.

5. Cognitive control strategies. These are the devices the person uses to control his cognitions. This variable has not been used in labour pain research in the past. However, there is considerable evidence that cognitive strategies can reduce pain, especially if subjects are allowed to choose their own cognitive strategy. (Chaves & Barber, 1974; Grimm & Kanfer, 1976; Knox, 1973; Levendusky & Pankratz, 1975; Liebeskind & Paul, 1977; Scott & Barber, 1977). Therefore it should be examined as a possible factor affecting labour pain. The cognitive strategies explored in the above mentioned research (focusing, imagery thought diversion, relaxation) closely resemble pain control techniques taught in prenatal classes.

6. Mental health. This variable was estimated subjectively by Nettlebladt et al. (1976) in three ways: (a) number of mental symptoms (e.g., depression), (b) signs of mental disturbance (restlessness, lowered mood and psychomotor retardation), (c) degree of mental handicap (a subjective evaluation). Nettlebladt et al. (1976) found a significant correlation with pain using this variable and state that possibly the parallel with pain reflects the general finding that psychoneurotics have a significantly lower pain reaction threshold than normals.

7. Menstrual history, and sexual desire. Menstrual history refers to the first menstrual experience and menstrual pain. Davenport-Slack and Boylan (1974) use this dimension without stating why it should influence pain. Perhaps they assume that the same factors influencing menstrual pain would influence any pain associated with reproduction. However neither they nor Norr et al. (1977) found this variable to correlate significantly with pain.

8. Masculinity-femininity. Zuckerman et al. (1963) used this variable in their study of labour pain, however they do not explain why this should correlate with pain, and no significant correlation was found. Perhaps the less feminine the woman feels, the more she rejects her femininity, and thus the more negative her attitude towards pregnancy.

9. Positive self concept. Women who feel positive about themselves should view most of their experiences

positively--even painful ones. Norr et al. (1977) used this variable and found it to correlate negatively and significantly with pain in labour.

10. Traditional sex role attitudes. An example of a traditional sex role attitude is that the male should be dominant in the home. Such attitudes may be related to more pain since women who have these views about sex roles do not feel the husband should participate and are less likely to attend prenatal classes (which stress husband participation) or seek information on pain control techniques. Norr et al. (1977) did not find this variable to correlate significantly with pain. Zuckerman et al. (1963) did not find a significant correlation between rejection of the home-maker role and amount of analgesics.

11. Neuroticism. Neuroticism is emotional over-responsiveness. People high in neuroticism are generally more anxious. Neuroticism is also associated with autonomic lability and therefore we may expect neurotics to have more pain in labour. Eysenck (1961) failed to find a significant correlation of neuroticism with pain of labour.

12. Rigidity. Eysenck (1961) does not explain why the lack of flexibility should correlate with pain, although he examined this in his study. He did not find a significant correlation between rigidity and pain of labour.

### Demographic variables.

1. Socioeconomic status. Socioeconomic status is the status of the individual in society according to her or her spouse's occupation and education. This variable was assumed to correlate with pain since it indicates better health and better resources and orientation to labour and pregnancy (usually internal locus of control, less worry, etc.). Klusman (1975) and Bergstrom-Walan (1963) found that the groups receiving prenatal preparation were more educated than control groups. We may therefore assume that the more education the woman has, the more she will actively prepare for the delivery and hence the less pain she will experience. Rosengreen (1961) found that the higher the socioeconomic status, the shorter the labour. However, Norr et al. (1977) and Nettlebladt et al. (1976) did not find a significant correlation between socioeconomic status and pain of labour. Nettlebladt et al. (1976) found a significant negative correlation with educational level of partner, however Bergstrom-Walan (1963) and Davenport-Slack and Boylan (1974) did not find this correlation significant. Bergstrom-Walan (1963) did not find a significant correlation between occupation and pain of labour either.

2. Cultural background. Different cultural groups teach members to react to pain differently--some things are expected to cause much pain in one cultural group and less in another. Winsberg and Greenlick (1967)

failed to find a significant difference between negro women and white women in pain of labour.

Chapman (1944) found differences in pain perception and pain reaction threshold (lowest intensity that caused wincing) between Northern Europeans, Italians, Russian Jews and Negroes.

Weisenberg (1977) after reviewing the literature, states that major differences among racial groups appear in the tolerance and not in the threshold of pain. These differences are mainly because of underlying attitudes and anxiety reactions. The attitudes dealt with are relative willingness either to deny or to avoid dealing with pain or to get rid of the pain. Weisenberg explains different cultural reactions to pain from a social comparison standpoint. When outside sensory means for evaluating the validity of one's judgements of the world are lacking, the individual turns toward his social environment in order to validate his judgements and to determine what reactions are appropriate. The models chosen are those most similar to oneself. One should remember that in laboratory studies it was found that people's ratings of painful stimuli, in terms of tolerance, threshold and pain, were influenced by a confederate model (Craig, Best, & Reith, 1974; Craig & Weiss, 1972).

3. Age. Presumably the older the woman, the more births she has experienced, and she has had greater exposure to information. Therefore older women were



expected to suffer less pain in childbirth. Norr et al. (1977) expected the opposite correlation, but did not explain why. Perhaps the older the woman the less flexible her body is and therefore the more pain she will experience. However none of the studies which examined age found a significant correlation with pain (Bergstrom-Walan, 1963; Cogan et al., 1976; Davenport-Slack & Boylan, 1974; Nettlebladt et al., 1976; Norr et al., 1977). Winsberg and Greelick (1967) found a negative correlation between age and pain of labour but did not test for significance.

Chapman (1944) found that among normal controls with an age range of 10 to 85 years, pain perception threshold and pain reaction threshold (the lowest intensity where a subject shows the first objective evidence of withdrawal from the pain stimulus) showed increases with age. Procacci, Bozza, Buzzelli, and Della Corte (1970, cited in Weisenberg, 1977) used a larger number of subjects (518) than other studies. The age range was 18 to 28 and 50 to 90 years. Threshold increased progressively with age. Clark and Mehl (1971, cited in Weisenberg, 1977) found that most of this increase can be attributed to reluctance to label the noxious stimulus as "pain" and not a result of a change in sensitivity.

#### 4. Relation to partner, length of marriage.

These factors presumably affect the attitude to pregnancy and the amount of support and help the woman gets from her partner. Further, women who are not close to their

partners are less likely to go to prenatal classes where the partner may be required to participate. Norr et al. (1977) did not find a correlation between marital closeness and pain of labour. Nettlebladt et al. (1976) did not find a correlation between pain of labour and relation to partner or length of marriage. Zuckerman et al. (1963) did not find a correlation between marital conflict and pain of labour measured by amount of analgesics needed.

5. Intelligence level. Eysenck (1961) examined this variable but did not explain why it should correlate with pain. Perhaps the more intelligent, more educated, will seek more information. However Eysenck failed to find a significant correlation with pain.

To summarize the current state of knowledge: (a) some variables have been examined in only one study and found to be significant (Grantly Dick-Read preparation, extroversion-introversion, mental health, positive self concept and education level of partner); (b) only two variables (anxiety about pain in birth, general anxiety) have been found significant in more than one study; (c) all the remaining variables have either not been examined, not been found significant, been found significant in some studies but not others or significant in opposite directions in different studies.

Even with respect to those variables that are significant, we do not know for sure if it is indeed the variable per se that is influencing the pain or a

mediating variable. For instance, prenatal preparation per se may not be a significant factor, rather it may be locus of control. Norr et al. (1977) found that belief in fate control correlated with attendance at Lamaze classes. Therefore, perhaps only internals take the course as they may feel that these courses would help them help themselves. Many such variables have not been controlled for by either taking a homogeneous group regarding the variable or by statistics. This might also be one of the reasons for the contradictory findings.

#### Critique of Existing Research

The studies reviewed have broken some ground but the following list of evident limitations were taken into account in the study presented here. These limitations may be the reason for the conflicting findings.

1. The above mentioned studies refer to pain only along its intensity dimension and not along other dimensions (i.e., affective, evaluative and sensory). Even along the intensity dimension, the range of possible responses was limited. A complete study of labour pain should start with a more adequate measure of pain.

2. Variables other than the ones related to pain were measured at inappropriate times. For example, attitude about pregnancy and worries about pain in birth were measured by Norr et al. (1977) after, instead of before childbirth. By asking the women to fill out the applicable questionnaires before birth (i.e., pregnancy attitude,

and birth fears variables), the researchers would not have had to make an assumption that these variables were not influenced by the birth experience.

3. A small number of variables were used in the studies, and those variables not used were usually not controlled for (e.g., age, socioeconomic status, etc.). Therefore, the results may be biased either by not finding a significant relationship where one really exists, or by finding one where it does not (e.g. we might conclude that prenatal preparation is an important variable while the correlation with pain may be attributed to locus of control that was not controlled for, or measured).

4. Some of the variables used were not adequately measured (i.e., scales containing very few possible answers were used), or the measuring device was not reported.

5. Some independent variables used in the studies did not assume their full range (e.g., only low socioeconomic status women were used even though socioeconomic status was an independent variable). This may result in lack of significance.

6. Some variables used in the studies, including pain, were determined by the experimenter subjectively.

7. Studies often used a small number of subjects overall, or a small number of subjects in each group.

8. Only two studies used multiple regression and of them, only one used the hierarchical model. Other kinds of statistics may not give a clear picture of

the importance of psychological childbirth related variables over and above that of other variables, since the influence of other variables may not be partialled out (for further elaboration see multiple regression analysis:- rationale section p.52).

#### Limitations of single studies.

1. One study (Cogan et al. 1976) used amount of pain in each stage as a predictor of pain in the next stage. This adds little to our understanding of causes of pain in labour and may even cause a response set to influence the results.

2. Cogan et al. (1976) did a replication of their study (reported in the same article) the results of which had little resemblance to the first study. This raises a question about reliability of their data.

3. Javert and Hardy (1951) measured pain of labour using a different kind of pain (i.e., they varied the pain of thermal radiation until the woman said it matched her labour pain). This may be inaccurate and furthermore, it does not seem humane to inflict additional pain on the woman undergoing pain of labour.

#### Present Study

The above literature review identified numerous variables which have been found to correlate with pain. While some findings have not always been replicated, there is still considerable support for the effects of demographic, trait, and childbirth related variables on the

pain of labour. However, because these variables have generally been studied in isolation, or a few at a time, using statistical analysis other than multiple regression which do not partial out common variability, an overall picture of the relative importance of these variables is not apparent. For example, the relation between prenatal preparation and pain of labour may be the result of participants' self selection, i.e., internals with respect to locus of control elect to participate while externals do not. Is the correlation between prenatal preparation and pain of labour significant after controlling for the effect of locus of control?

In recent years there has been a vast interest in prenatal classes, husband participation, and other psychological childbirth related variables. It is important to determine just how effective these variables are in controlling labour pain, after having statistically neutralized the effect of psychological and demographic variables. Since we can manipulate the psychological childbirth related variables, but not the physiological ones (with the exception of medication), it is also important to determine the contribution of psychological childbirth related variables to pain over and above that of trait variables, demographic variables, and physiological childbirth related variables. Once we know which set of variables and which variables in that set have an important influence

on labour pain, and once we can account for a large degree of variability, it will be possible for clinicians to treat expectant mothers, help them approach labour with less fear and experience less pain in the process. It will also be possible to predict where on the pain continuum a particular woman will fit, and this will allow for individual preparation for labour.

The specific questions dealt with in this study were: (a) Do psychological childbirth related variables make a significant contribution to pain of labour that is not due to trait, demographic, and physiological childbirth related variables? (b) What is the role of other childbirth related variables? Do they make equally significant contributions to the variance in labour pain? (c) Do trait or demographic variables contribute significantly to the pain of labour? (d) What is the cumulative variance predicted by all the sets of variables together? and (e) Which individual variables have a significant correlation with pain. We now explore the research conducted to answer these questions.

A statistical procedure, hierarchical multiple regression, is available which has considerable advantage for studying these issues. That is, the goal here is to ascertain whether a particular variable or set of variables has a significant effect on some measures, over and above the effect which can be predicted from some other set. Given such a goal, hierarchical multiple regression

is an ideal statistic to use. By entering the variables into the regression equation later, the unique contribution for these variables (relative to those entered earlier) can be identified. Four sets of variables were used and the order of their entrance into the equation was: demographic variables, trait variables, physiological childbirth and psychological childbirth related variables.

The order of entry into the regression places trait and demographic variables first, since they are characteristic of the woman even before pregnancy and labour. Therefore these variables may affect selection of childbirth variables and the opposite effect is not possible. Demographic variables are prior to trait ones for the same reason. The psychological childbirth related variables follow the physiological ones to allow for testing the unique contribution of the psychological variables. This has a practical benefit since we can manipulate the psychological variables but cannot manipulate the physiological ones (with exception of medication). This order is very important, since the increment attributable to a set of variables or to a variable, can change considerably according to where in the hierarchy it appears, and therefore what variables are partialled from it (Cohen & Cohen, 1975).



## Method

### Subjects

The subjects were 116 women who delivered at one of thirteen Metro Toronto hospitals. Through an arrangement with St. Michaels hospital, 30 women were approached by their doctors and asked to participate in this study. The remaining 86 women were asked to volunteer for the research by the researcher during one of their last prenatal classes. The prenatal classes visited were: Lamaze, Childbirth Education Association, Mothercraft, and prenatal classes in the following hospitals: Toronto General hospital, Branson hospital and York Finch General hospital. The doctors at St. Michaels hospital were chosen to give out the questionnaires since they were kind enough to agree to participate in the study and the chief of obstetrics was supportive. The above listed prenatal courses were chosen since they had agreed to participate. All women were primiparas (first pregnancy). The women's age ranged from 18 to 38 with a mean of 27 and a standard deviation of 3.9.

### Variables and Tests

Some of the scales especially created for this study have not been statistically constructed, so that validity and reliability might be questioned. However, these scales were created from the scales of previous studies and careful definitions of the goals of the present study in light of these previous studies. These

scales were submitted to a factor analysis and questions which did not load considerably were dropped.

Psychological childbirth related variables.

1. Amount of prenatal preparation. Nineteen questions designed for this variable used previously in an unpublished thesis by Quintal (Note 1) were used (e.g., making preparations for the baby at home). They were answered on a 1(never) to 5(very often) scale, and the sum of these answers was the amount of preparation. After factor analysis only 13 questions remained. This was expected to correlate negatively with pain.

2. Type of prenatal preparation. One question asking the woman if she participated in a Lamaze preparation course, a different course or no course at all. This variable was scored 2 if Lamaze, 1 if other and 0 if none, and was expected to correlate negatively with pain.

3. Doctor-patient rapport. Four questions designed especially for this research were used. They were derived after discussing this variable with Dr. Shelly Romalis, York University (e.g., how do you feel about your doctor? - very positively, etc.). After factor analysis one question was dropped. Two questions were answered on a 5 point scale (5-very well to 1-very poorly and 5-very positive to 1-very negative) and two on a 4 point scale (4-much rapport to 1-no rapport and 4-listen to your viewpoint to 1-did not discuss them at all). The answers to all

four questions were summed, and this was expected to correlate negatively with pain.

4.-6. Fears for self, fears for baby, lack of desire for pregnancy. These three scales were taken from an existing test by Manheimer and Shaefer (Note 2). The questionnaire was created specifically to determine the woman's attitude to pregnancy and childbirth. The questions are subtle (e.g., most women go through labour without much difficulty). Most questions were scored on a 4 point scale (strongly agree to strongly disagree or never to frequently). The rest were answered on a 2, 3, 5, or 8 point scale. These variables were expected to correlate positively with pain.

8. Presence of father was determined from a modification of a question designed for this variable and used previously in an unpublished thesis by Quintal (Note 1) dealing with infant behaviour and delivery. The question was: "During labour and delivery of the baby, the father of the baby: was not present, watched only", etc. This is a five point scale and was scored 1 for not present to 5 for even helped with delivery. However, since many women had difficulty deciding between "helped throughout" and "even helped with delivery", these two answers were merged and thus this variable is a 4 point scale. This was expected to correlate negatively with pain.

9. Amount of information about what to expect was obtained from two questions constructed for this

study: "How much information did you have about what to expect from labour and delivery" (answered on a 4 point scale-- 1-none at all to 4-a great deal), and "How different was your experience from your expectations" (answered on a 4 point scale-- 1-a great deal of difference to 4-not at all different). The two scores were used separately, and added to yield one score. This scale was expected to correlate negatively with pain.

10. Amount of pain expected. Each woman was asked to rate the pain she expected to feel in labour on a five point scale (5-excruciating to 1-none). It was unclear if this variable would correlate negatively or positively since expectations of high degrees of pain may cause the actual pain to seem higher, yet an expectation of little pain may cause the pain, if it exceeded the expectations, to seem higher as well.

#### Physiological childbirth related variables.

11. Medication amount was obtained by asking the doctor to list type, dosage and time for each medication given during labour. Following Standley, Soule, Copans, and Klein (1978) dosage and length of time between the administration of the medication and delivery were each scored on a 1(0-75 mg or over 8 hours) to 4(150 mg or more or less than  $1\frac{1}{2}$  hours) scale and these two scores were multiplied to receive a medication score. This was expected to correlate negatively with pain.

12. Complications of labour were determined from a questionnaire designed by Norr et al. (1977). The doctor or nurse filled this out after delivery. The questions dealt with aspects of labour and birth. Each complication either scored 3 points or 2 and these were added up. An example of a complication scoring three points is multiple birth, and one scoring two points is post-maturity. After factor analysis only four complications were used. This was expected to correlate positively with pain.

13. Length of labour was determined from a single question asking the woman how long she was in labour from the time of the first contraction until delivery. If the labour stopped for more than one hour at any point, then the labour length was calculated from the time it resumed until delivery. This was expected to correlate positively with pain.

Trait variables.

14. Anxiety. Spielberger's trait anxiety inventory was used. Questions were answered on a 4 point scale (almost never, sometimes, often, almost always). An example of a question is: "I tire quickly". Anxiety was expected to correlate positively with pain.

15. General reaction to pain. One question from Davenport-Slack and Boylan (1974) was used: "I am the type of person who shows pain--never, rarely, sometimes, often". This variable was expected to correlate positively

with pain.

16. Extroversion-introversion. Eysenck's Personality Inventory (EPI) was used. Questions were answered on a yes-no scale, e.g., "Are you usually carefree". Extroversion was expected to correlate positively with pain.

17. Locus of control. A short scale was constructed using items from Rotter's Locus of Control scale. A modified scale was used since Lefcourt (1976) states that although the existing locus of control scales are useful for general problems, in research dealing with specific issues where precision is important, appropriate scales should be constructed. Since no such measure was available specific to pain, a modification of Rotter's scale was used. An example of a modified item is: "75.a. Without the right breaks one cannot have an easy labour. b. Capable women who fail to have an easy labour have not taken advantage of their opportunities." This is a modification of item no. 6 which is: "a. Without the right breaks one cannot be an effective leader. b. Capable people who fail to become leaders have not taken advantage of their opportunities." Each answer was scored 1 or 0. After factor analysis only eight questions were used. Locus of control was expected to correlate positively with pain.

18. Cognitive control strategies. The woman was asked to describe anything that helped her cope with the pain. This was scored 1 if she used a cognitive

control strategy and 0 if she did not. This variable was expected to correlate negatively with pain.

Demographic variables.

19. Socioeconomic status was determined by asking the woman for her and her partner's occupations. This was entered in Blishen's tables (Blishen & Carroll, 1978; Blishen & McRoberts, 1976). Socioeconomic status scores range from 14.4 to 74.7. Male socioeconomic status was used unless the woman was unmarried or her husband was a student, since female socioeconomic status did not correlate significantly with pain. Socioeconomic status was expected to correlate negatively with pain.

20. Cultural group was determined by asking the woman where she was born, and where her parents were born if she was not Canadian born. It was scored 0 if Canadian born, and 1 if not. It was unclear how cultural group would correlate with pain.

21. Age was determined by asking the woman for her birth date, and rounding to closest year. Age was expected to correlate negatively with pain.

Three extra variables were constructed. These variables were constructed prior to analysis to compensate for variability which was not predicted, yet became apparent when collecting the data.

1. Length of painful labour. This is the length of time the woman was in pain--the net length of labour after the periods of complete analgesia were subtracted

from the total length, rounded to nearest  $\frac{1}{2}$  hour.

This was expected to correlate positively with pain.

2. Number of doctors. A number of women had changed doctors during pregnancy and other women were delivered by a doctor "on-call". This is a four point scale: 1--same doctor throughout, 2--two doctors in pregnancy and one of them delivered her, 3--one doctor in pregnancy and a different doctor in delivery, 4--two or more doctors in pregnancy and a different doctor for delivery. This variable was expected to correlate positively with pain.

3. Epidural. Since not all women experienced transition without analgesia and some had absolutely no pain during this stage, this variable was constructed to account for the variability in pain as a result of measuring pain at different stages. It ranges from 1 to 5, 1 being no epidural or epidural after transition, 2--epidural during transition, 3-5--epidural before transition, 3--pain rated during transition when epidural wore off, 4--pain rated before epidural, 5--pain rated during transition when epidural not complete. This variable was expected to correlate negatively with pain.

The variables were divided into four sets: (a) Psychological childbirth related variables: amount of prenatal preparation, type of prenatal preparation, doctor-patient rapport, fears for self, fears for baby, lack of desire for pregnancy, hospital situation, presence of father,



amount of information about what to expect, amount of pain expected. These were included in Questionnaire #2 (see Appendix 2), except for fears for self, fears for baby, and lack of desire for pregnancy which were included in Questionnaire #1 (see Appendix 1). (b) Physiological childbirth related variables: medication, complications of labour, length of labour. Medication and complications are included in Questionnaire #3 (see Appendix 3), and length of labour is included in Questionnaire #2 (see Appendix 2). (c) Trait variables: anxiety, general reaction to pain, extroversion, locus of control, cognitive control strategies. These are included in Questionnaire #2 (see Appendix 2). (d) Demographic variables: socioeconomic status, culture, age. These are included in Questionnaire #2 (see Appendix 2).

The three extra variables: length of painful labour, number of doctors, epidural, were included in Questionnaire #2 (see Appendix 2).

Three different pain measures were used: (a) Pain #1 was measured by a 10 cm line, on one side was written: "No pain at all" and on the other side: "My pain is as bad as it could possibly be" (after Aitken, 1969). The number of millimeters between the left end of the line and the subject's mark was used. (b) Pain #2 was measured by asking the woman how their pain was at its worst. This was answered on a 5 point scale ranging from 1-very mild to 5-very severe (after Winsberg & Greenlick, 1967).

(c) Pain #3 sensory, Pain #3 affective, Pain #3 evaluative, Pain #3 total. Parts of the McGill Pain Questionnaire designed by Melzack (1975) were used. The women were given 78 words divided into three categories and 20 subscales. The women were asked to choose the words which describe their pain. The rank values of the words chosen were added up for each category separately and then for all categories together. In each subscale the word indicating least pain was given a value of 1. The scores range from 0 to 54 for the sensory category, 0-19 in the affective category, 0-5 in the evaluative category, and 0-78 for the total score.

#### Design and Procedure

The women were approached in two different methods. Thirty were asked by their doctor at one of their prenatal checkups to volunteer for the study. The doctor then gave them the first questionnaire and the information/consent form to fill out at home (see Appendix 1 and Appendix 5). The other 86 women were approached in one of their last prenatal classes. Those that volunteered were given questionnaire #1 and the information sheet as well. Their pain was rated by them with the experimenter present one to five days after delivery. At that time they were given the second questionnaire (see Appendix 2). The patient's doctor or his nurse (or in some rare occasions the experimenter with the patient) filled out the medication and labour complications

questionnaire (see Appendix 3).

Hierarchical multiple regression was carried out on the data. The hierarchical multiple regression was used separately for each pain indicator, and tests of significance were made for each regression and for each question raised.

Multiple regression analysis - rationale. Simple correlations between certain variables and the pain of labour cannot be used efficiently in this study for two reasons: (a) Since there are 24 variables and six pain measures, the resulting 144 correlations would increase the probability of type 1 errors considerably. (b) It would not be possible to know if a certain correlation was significant and shows a unique contribution of that variable, or really was a result of a third **mediating** variable. For instance, the study by Cogan et al. (1976) found that greater practice by the wife and husband before birth was related to more pain in early labour. They state this may have been due to higher anxiety which resulted in more practice on one hand, and in more pain on the other. However, if they had done a hierarchical multiple regression entering anxiety before the variable of practice, they would have either found that the variable of practice did not prove significant at all (i.e., anxiety was the **mediating variable**), or that it did prove significant (i.e., a different **explanation is necessary**). By entering trait and

demographic variables first, questions of this sort are eliminated.

Therefore, a multiple hierarchical regression (Cohen & Cohen, 1975) was carried out, which partials out overlapping variability and keeps  $\alpha$  constant for each set of variables (demographic, trait, physiological childbirth variables and psychological childbirth variables). Each set was entered in the above order. This analysis attributes common variability to the variable entered first. Therefore, increase in  $R^2$  (the semi-partial correlation) associated with each set of variables is the increase in pain variance accounted for by the entering set of variables beyond what had been accounted for by the previously entered variables. One F ratio is calculated for the  $R^2$  change for each set of variables, and for each individual variable, in each multiple regression.

### Results

Three scales were constructed specifically for this study and two scales were constructed by other researchers for previous studies. All these scales were factor analyzed so that the items not contributing to the general factor measured by the specific scale could be dropped. The scales that were factor analyzed were: amount of prenatal preparation, doctor-patient rapport, hospital situation, complications of labour, and locus of control.

As a result of this analysis, 6 out of 19 items were dropped from amount of prenatal preparation, one out of four questions were dropped from doctor-patient rapport, one out of five from hospital situation, 10 out of 14 from complications of labour and 12 out of 20 from locus of control. Factor loadings for these analyses are detailed in Appendix 6.

Six different pain variables were used. The correlations between these measures are reported in Table 1. Both Pain #1 (a 10 cm line) and Pain #2 (a 5 point scale) correlate poorly with the four Pain #3 scores (Melzack's pain questionnaire), but highly with each other ( $r = .63$ ). Pain #3 affective, Pain #3 sensory and Pain #3 total correlate highly with each other (.56; .77; .96). Pain #3 evaluative correlates poorly with all other pain measures (.10 to .42).

Table 1  
Correlations Between the Six Pain Variables  
in the "All Women" Group

	Pain #1	Pain #2	Pain #3 Sensory	Pain #3 Affec- tive	Pain #3 Eval- uative
Pain #2	0.63				
Pain #3 Sensory	0.23	0.23			
Pain #3 Affective	0.40	0.36	0.56		
Pain #3 Evaluative	0.42	0.39	0.10	0.34	
Pain #3 Total	0.34	0.33	0.96	0.77	0.26

The women were divided into two groups: (a) those that received an epidural before transition, and (b) those that did not receive an epidural before transition. It was necessary to consider these two groups separately since for the no-epidural group pain during transition (which is the most painful stage) was measured. However, in the epidural group some women had no pain during transition, and therefore their pain had to be measured at a different period. Others had very mild pain during transition because of a partial epidural, and this had to be taken into consideration. The mean pain ratings for these two groups are presented in Table 2. Since mean pain ratings for these two groups are not substantially different, the two groups were also combined for multiple regression analysis, and a variable (epidural) was included to represent this factor. These three groups, epidural, no-epidural and all women are presented throughout the results section.

Multiple regression analysis findings. Table 3 describes the results of the hierarchical multiple regression. The only significant multiple correlations are with Pain #3 affective and Pain #3 total. The added variance explained ( $R^2$  change) for the four sets of variables indicates that demographic variables add a significant increment in Pain #3 **sensory** and Pain #3 total, trait variables add a significant increment in Pain #3 affective, physiological childbirth related variables

Table 2  
Comparison of Means and Standard Deviations  
of the No-Epidural and Epidural Groups  
for each of the Six Pain Variables

Group	Pain measure	Mean	Standard deviation	N	T-test	df
No-epidural	Pain #1	75.13	19.04	70	0.01	114
Epidural	Pain #1	75.07	26.71	46		
No-epidural	Pain #2	4.16	0.74	70	1.32	114
Epidural	Pain #2	4.24	0.95	46		
No-epidural	Pain #3 Sensory	23.21	10.56	70	0.11	114
Epidural	Pain #3 Sensory	25.83	10.33	46		
No-epidural	Pain #3 Affective	6.17	4.23	70	0.37	114
Epidural	Pain #3 Affective	6.71	3.94	46		
No-epidural	Pain #3 Evaluative	3.81	1.32	70	2.41*	114
Epidural	Pain #3 Evaluative	4.00	2.09	46		
No-epidural	Pain #3 Total	33.20	13.24	70	0.18	114
Epidural	Pain #3 Total	36.33	13.90	46		

\*p .02



Table 3

Increment in Squared Multiple Correlation  
Accounted for by each Variable Set

De- pendent V	Inde- pendent V	Demogra- phic variables		Trait variables		Physio- logical variables		Psycho- logical variables		Total	
		R <sup>2</sup> change	p	R <sup>2</sup> change	p	R <sup>2</sup> change	p	R <sup>2</sup> change	p	R <sup>2</sup>	p
Pain #1	all	0.015	ns <sup>a</sup>	0.032	ns	0.08	0.05	0.15	ns	0.29	ns
	no-ep	0.014	ns	0.044	ns	0.04	ns	0.20	ns	0.38	ns
	epid	0.015	ns	0.138	ns	0.06	ns	0.37	ns	0.71	ns
Pain #2	all	0.025	ns	0.025	ns	0.04	ns	0.12	ns	0.21	ns
	no-ep	0.037	ns	0.029	ns	0.04	ns	0.26	ns	0.44	ns
	epid	0.030	ns	0.171	ns	0.03	ns	0.28	ns	0.56	ns
Pain #3 Sen- sory	all	0.050	ns	0.041	ns	0.03	ns	0.14	ns	0.27	ns
	no-ep	0.021	ns	0.006	ns	0.06	ns	0.23	ns	0.40	ns
	epid	0.078	0.05	0.064	ns	0.11	ns	0.24	ns	0.59	ns
Pain #3 Af- fec- tive	all	0.007	ns	0.128	0.01	0.11	0.05	0.16	0.05	0.41	0.01
	no-ep	0.009	ns	0.149	0.05	0.12	0.05	0.20	ns	0.49	0.05
	epid	0.035	ns	0.113	ns	0.19	ns	0.34	ns	0.73	0.05
Pain #3 eval ua tive	all	0.008	ns	0.069	ns	0.05	ns	0.10	ns	0.23	ns
	no-ep	0.013	ns	0.110	ns	0.01	ns	0.21	ns	0.34	ns
	epid	0.034	ns	0.152	ns	0.09	ns	0.36	ns	0.64	ns
Pain #3 To- tal	all	0.029	ns	0.073	ns	0.05	ns	0.16	0.05	0.32	0.05
	no-ep	0.007	ns	0.039	ns	0.08	ns	0.23	ns	0.42	ns
	epid	0.061	0.05	0.092	ns	0.12	ns	0.25	ns	0.64	ns

<sup>a</sup>ns means not significant

add a significant increment in Pain #1 and Pain #3 affective and psychological childbirth related variables  
add a significant increment in Pain #3 affective and Pain #3 total.

Tables 4 through 6 list all independent variables which correlate significantly with one of the dependent pain variables. As can be seen epidural, presence of father and fears for self are significant more often than any other variable.

Not all variables correlated in the direction anticipated. We will now review the pattern that emerged. Fear for self, lack of desire for pregnancy, amount of information, length of labour, length of painful labour, anxiety, extroversion and locus of control always correlated according to expectations. Epidural and complications correlated half the time according to expectations and half the time opposite expectations. Lastly, fear for baby, presence of father, number of doctors, and medications always correlated in the opposite direction to that predicted.

Table 4

Independent Variables that Correlate Significantly\*  
 with the Pain Variables  
 The All Women Group

Dependent pain variable	Significant independent variable	Expected direction of correlation	Direction of correlation
Pain #1	Amount of pain expected	+ or -	-
Pain #2	Amount of information	-	-
Pain #3 Sensory	Culture	+ or -	-
Pain #3 Affective	Extroversion	+	+
	Locus of control	+	+
	Complications	+	+
	Length of labour	+	+
	Medication	-	+
	Fears for self	+	+
	Presence of father**	-	+
Pain #3 Evaluative	Length of labour	+	+
	Number of doctors	+	-
Pain #3 Total	Extroversion	+	+

\*  $\alpha = 0.05$

\*\*  $\alpha = 0.01$

APPENDIX D

Mean Digit Temperatures for Control Subjects\*

T I M E	S E X			
	Male		Female	
	Left Hand	Right Hand	Left Hand	Right Hand
Start	30.5	30.4	29.3	29.0
Minute 4	32.8	32.5	30.5	30.5
Minute 32	33.8	32.9	29.9	29.8
Minute 36	33.8	32.9	29.9	29.8

\*Temperature= $^{\circ}\text{C}$

Table 5

Independent Variables that Correlate Significantly\*  
 with the Pain Variables  
 The No Epidural Group

Dependent pain variable	Significant independent variable	Expected direction of correlation	Direction of correlation
Pain #1	Epidural	-	+
Pain #2	Epidural	-	+
	Fear for baby	+	-
Pain #3 Sensory	Epidural	-	+
Pain #3 Affective	Extroversion	+	+
	Anxiety	+	+
	Complications	+	-
	Medication	-	+
	Amount of information	-	-
Pain #3 Total	Epidural	-	+
	Medication	-	+
	Amount of information	-	-

\*  $\alpha = 0.05$

Table 6

## Independent Variables that Correlate Significantly\*

## with the Pain Variables

## The Epidural Group

Dependent pain variable	Significant independent variable	Expected direction of correlation	Direction of correlation
Pain #1	Epidural	-	-
	Locus of control	+	+
	Lack of desire for pregnancy	+	+
	Presence of father	-	+
Pain #2	Locus of control	+	+
	Presence of father	-	+
Pain #3 Sensory	Epidural	-	-
	Fear for self	+	+
Pain #3 Affective	Length	+	+
	Fear for self**	+	+
	Presence of father	-	+
	Amount of pain expected <del>for</del>	<del>+</del>	-
Pain #3 Evaluative	Presence of father	-	+
Pain #3 Total	Epidural	-	-
	Length of painful labor	+	+
	Fear for self**	+	+

\*  $\alpha = 0.05$ \*\*  $\alpha = 0.01$

### Discussion

The present investigation sought to determine the extent to which measures related to the psychological preparation for labour would account for variability in labour pain over and above the variability explained by trait, demographic and physiological variables. The findings indicate that overall the four sets of variables accounted for a modest amount of variability in the pain of labour. Only two pain measures (Pain #3 affective and Pain #3 total) showed a significant multiple correlation. The psychological variables accounted for most of this variance, but were significant in only two analyses. Among these variables, presence of father and fears for self contributed significantly to the explained variables more often than any other psychological childbirth variable. Amount of information, pain expectation, fears for baby and lack of desire correlate significantly for a few regressions; amount of prenatal preparation, type of prenatal preparation, doctor-patient rapport and hospital situation never added a significant increment to the multiple regression.

There are a number of factors which may have lowered the explained variability in pain. These will now be examined.

1. Not all women received an epidural. Even among those that did receive one there was no uniformity. For some it resulted in only a partial analgesia, in others

a total analgesia which later on wore off slightly or totally. Consequently, pain ratings referred to different stages of labour, not just to transition which is usually the most painful. However, the pain ratings of epidural and no-epidural groups were very comparable, differing on only one measure. In addition the multiple regression took out epidural as a factor, so that any influence of this factor was removed before other variables were examined. Furthermore, separate multiple regression analyses on the epidural and no-epidural groups yielded results generally consistent with the overall analysis. Therefore if epidural was the main factor creating noise in the pain ratings, it should have produced large  $R^2$  changes in the multiple regression analyses, as well as larger  $R^2$  appearing when separate analyses were done on epidural and no-epidural women. Since these did not happen, it appears that epidural treatment was not a major source of variability in pain ratings.

2. The pain of labour was measured after birth rather than during the transition stage of labour. This is a problem since the recall of the pain is influenced by many factors--medication during delivery, birth defects in the newborn, postpartum blues, to name a few. In addition some women were told by their husband, doctor or nurse that they had an easy labour and although they did not believe this to be true, it may have served to



lower their pain ratings. The pain was measured after delivery since there was difficulty in gaining access to the women during labour and in predicting when transition will occur. A related problem is that some variables which should have been measured before birth (locus of control, extroversion, general reaction to pain, socioeconomic status, cultural background, trait anxiety, amount of pain expected, amount of preparation) were not measured until after birth. This entered a bias into the responses by letting the birthing experience influence the variables. This notion gains support from reports by the women that their answers to items on the locus of control scale would have been different if asked before labour. However most of these variables are trait variables and would not be expected to change significantly from situation to situation. While pain recollection is different from actual pain experience, the women were approached 1-5 days after delivery (mostly 1-2 days) so the experience was still quite fresh in their minds. This delay in pain rating is a major limitation of this study and may have contributed to the unexplained variability in the pain ratings. This is especially true for the pain intensity ratings. However, for the affective, sensory and evaluative ratings, where the women had to pick out words to describe their pain, it is possible that after the pain is gone it might be easier to pick out words that most accurately describe

the qualities of the pain.

3. In the absence of available standardized measures for some variables, either new ones were created or scales created by others and used in very few studies were used. It would of course have been better to use scales tested for their reliability and validity. A step towards that was taken by factor analyzing these scales and using the results to discard items which did not load heavily on the main factor. Some scales had specific problems: (a) Hospital situation--one of the questions asked the woman if while in labour she heard any screaming from other women. It was assumed this would raise the pain perception (by raising anxiety) and was scored accordingly. However, three women commented that this was a positive experience as they did not feel alone anymore and it gave them something to compare their pain to. In addition one said she heard moaning rather than screaming and this should be included in this variable in future research. Other factors should be taken into account as well by this variable for instance: one woman was asked to fill out forms during her labour and that upset her very much. (b) Amount of information. One part asks how different the experience was from the expectation. The theory was that if it is very different it will raise pain perception. However, five women said it was better than expectations. This would tend to lower pain perception. Therefore in future women should be asked to rate the

difference between expectation and actual pain in both positive (better) and negative (worse) directions.

(c) Amount of preparation. The questions refer to preparation in last three months, however some women did their preparation before the seventh month and this is not reflected in the questions. Therefore the scale should be modified to include preparation throughout labour. This, however, did not affect more than a few women.

4. The women were approached between their fifth and ninth months and this might have added to the variability in the prenatal questionnaire. Some had even forgotten to fill it out before birth or filled it out and lost it and they had to do or redo it after birth. Upon comparison it turned up that there is no significant difference between the women who completed the prenatal questionnaire after birth and those that did it before (see Appendix 8).

5. It might have been better to have more women in the study, judging from the number of variables, however 116 women left a sufficient number of degrees of freedom (25,90) in the multiple regression analysis.

6. A small number of women (three) had difficulty understanding English and therefore the questionnaires had to be explained to them. Others were tired, or busy when asked to fill out the post-natal questionnaire. For example, visitors arrived before they had completed it, or the baby came to feed, and it had to be left with them to

fill out later and send in. These factors may have served to reduce the explained variability. On the other hand, negative reactions to the questionnaire were few and mostly came in the form of refusing to continue to cooperate and consequently being dropped from the study. On the whole the women were very glad to participate and extremely cooperative.

7. Although correlational studies do not allow us to predict cause and effect, it is not feasible to design a study that will manipulate all these variables. Some variables (e.g., trait, demographic variables and most physiological variables) cannot be manipulated. While others (e.g., doctor-patient rapport, hospital situation, amount of information about expectations), although they can be manipulated, it is neither practical nor humane to do so since we might be causing greater pain.

8. Although no measures were without variability, some received a limited number of possible values, e.g., cultural background was scored 0 or 1, type of prenatal preparation, 0,1,2. This results in low variability and therefore lower correlations with pain than might have been expected. However, among the psychological childbirth variables which contributed most to the variance are some of these variables. Therefore although a limitation, the restricted range did not obscure the relationship of these variables to pain.

The limitations raised above may well have introduced noise into the present data, and may be at least partly responsible for the unexplained variance. Nevertheless, this investigation was based on a relatively large sample of women, using a wide range of measures collected under conditions which were as consistent as it was practical to establish. Therefore, it is reasonable to view the results of this study as having a fair degree of validity and generalizability. At the very least, the major findings of this study should be seriously compared to the existing literature.

The first finding requiring comment is that the ratings of pain along the intensity dimension did not yield significant correlations, and only two of the four pain ratings along other dimensions yielded significant correlations. Both the low correlation between the 10 cm line and the 5 point scale and Melzack's pain questionnaire, and the lower multiple regression on these pain measures indicates that pain of labour should not be measured just on an intensity scale. Instead, the sensory, affective and evaluative qualities of the pain should be taken into consideration as they are in Melzack's pain questionnaire. In specific the affective component of pain (i.e., tension, fear and autonomic properties) appears more useful than the intensity ratings, the overall rating or ratings along sensory or evaluative dimensions.

Other pain of labour studies also report low correlations (Davenport-Slack & Boylan, 1974; Klopfer et al., 1975; Norr et al., 1977).

Secondly, psychological variables did provide a relatively unique correlation with two pain measures. The variables within the set contributing significantly to this relationship were: presence of father and fear for self. These variables were found to be significant in some studies and not in others. Other psychological childbirth related variables which correlated significantly with pain of labour were: lack of desire for pregnancy, fear for baby, amount of information, amount of pain expected, number of doctors. None of these variables were used in pain research previously.

These findings support the value of psychological childbirth preparation, although not necessarily of prenatal courses since type of prenatal preparation did not correlate significantly with pain of labour.

Thirdly, medication and presence of father correlated positively with pain in this study although they were expected to correlate negatively with pain.

The positive correlation with presence of father might be explained in view of the fact that today it is not only acceptable for the father to be present, but is expected and perhaps some couples, rather than deciding for themselves if this is something they want to do are pressured by their peers, or society or even the childbirth

classes into something they are not able to cope with effectively. Therefore perhaps it is not always desirable for the father to be present, but should be left up to the couple. Future research into the difference between couples who benefit from this situation and those that do not may help to shed more light on the subject.

The positive correlation with medication might be due to the fact that only women in great pain are given medication, or that the medication does not really reduce the pain but creates such an expectation and when it is not fulfilled, anxiety which results creates an impression of more pain. **The second explanation** seems to be borne out by informal discussions with women after labour and delivery. In addition a research by Javert and Hardy (1950) found that demerol (which is one of the main medications used in labour) was ineffective in reducing pain of labour.

**Fourthly,** the findings of this study in the trait, demographic and physiological variables sets are consistent with other research in the field. Of these **variables** only epidural correlated consistently with pain and medication, complications, length of labour and length of painful labour, culture, extroversion, locus of control and anxiety correlated significantly a few times with pain of labour. Socioeconomic status and age did not correlate with pain of labour at all.

Lastly, women who received an epidural before transition reported more pain than women who did not. This might be interpreted in two ways--either they got the epidurals because of higher pain or they expected total pain relief and when it did not always come about they became anxious and this in turn raised their pain levels. From talking to the women, the second interpretation appears correct, but more research is needed before one can make this conclusion. If it is borne out then it will become very important to prepare women to the fact that an epidural may not always relieve the pain, or perhaps try to determine the differences between women who get relief from this medication and women who do not.

The act of labour and childbirth is much more than just a painful experience. It is one of the most fulfilling and wonderful experiences in a woman's life. However, pain plays a part in this experience. Some feel it is a necessary and positive part since it increases the bonding, as we tend to have a firmer tie to things we suffered for. Others feel it is an unnecessary and wasteful part and that women need not suffer any pain if only we prepare them well.

Theorists from both extremes admit that most women today suffer pain in labour. As psychologists it is our duty to try and lessen pain and suffering be it in emotional or physical conditions. So while we realize that by focusing only on the pain we may have



lost sight of the totality of the experience, it was necessary for our purposes.

As part of this research the women were asked to tell us about the childbirth. Most felt it was a thrilling and exciting moment. Some felt the labour was only a necessary step before the actual birth which was the main event of importance. Most described it in terms of a joyous, awesome, achievement, as a job well done, beautiful and rewarding, although a great many felt it was more than they expected in terms of pain.

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## APPENDIX 1

## Questionnaire #1

In the following questions, we would like to know about some of your feelings about pregnancy and labour. It is important that you answer all questions. After each statement, please check the answer that best describes your feelings. There are no right or wrong answers, we only want to find what the experiences of women are.

1. Most women go through labour without much difficulty.  
Strongly agree\_\_\_\_ Mildly agree\_\_\_\_ Mildly disagree\_\_\_\_  
Strongly disagree\_\_\_\_
2. Before pregnancy, I had been looking forward to having a baby.  
Strongly agree\_\_\_\_ Mildly agree\_\_\_\_ Mildly disagree\_\_\_\_  
Strongly disagree\_\_\_\_
3. Some people may think it's silly to have superstitions during pregnancy, but I find that I have them.  
Often\_\_\_\_ Occasionally\_\_\_\_ Rarely\_\_\_\_ Never\_\_\_\_
4. If she would only admit it, every pregnant woman is scared and worried.  
Strongly agree\_\_\_\_ Mildly agree\_\_\_\_ Mildly disagree\_\_\_\_  
Strongly disagree\_\_\_\_
5. When I first found out that I was pregnant, I was:  
Delighted\_\_\_\_ Happy\_\_\_\_ Just accepted it - was neither  
happy nor unhappy\_\_\_\_ Somewhat unhappy\_\_\_\_  
Extremely unhappy\_\_\_\_
6. The baby can be harmed if the mother gets upset during pregnancy.  
Strongly agree\_\_\_\_ Mildly agree\_\_\_\_ Mildly disagree\_\_\_\_  
Strongly disagree\_\_\_\_
7. I worry about having a great deal of pain during childbirth.  
Frequently\_\_\_\_ Occasionally\_\_\_\_ Rarely\_\_\_\_ Never\_\_\_\_
8. I would like to have:  
A boy\_\_\_\_ A girl\_\_\_\_ It makes no difference\_\_\_\_
9. I am afraid that my baby may be ugly or unattractive.  
Frequently\_\_\_\_ Occasionally\_\_\_\_ Rarely\_\_\_\_ Never\_\_\_\_
10. Any pregnant woman dreads delivery.  
Strongly agree\_\_\_\_ Mildly agree\_\_\_\_ Mildly disagree\_\_\_\_  
Strongly disagree\_\_\_\_

11. I did not want to have a baby at this time.  
Strongly agree\_\_\_\_ Mildly agree\_\_\_\_ Mildly disagree\_\_\_\_  
Strongly disagree\_\_\_\_
12. Any pregnant woman is concerned whether her baby will be normal.  
Strongly agree\_\_\_\_ Mildly agree\_\_\_\_ Mildly disagree\_\_\_\_  
Strongly disagree\_\_\_\_
13. If I had the choice, while delivering the baby, I would prefer to be: "Out"\_\_\_\_ Awake, but have drugs that would ease the pain\_\_\_\_ Completely awake and not use drugs\_\_\_\_
14. Before I became pregnant, we were hoping to have a baby.  
Strongly agree\_\_\_\_ Mildly agree\_\_\_\_ Mildly disagree\_\_\_\_  
Strongly disagree\_\_\_\_
15. I worry that I may lose my baby.  
Frequently\_\_\_\_ Occasionally\_\_\_\_ Rarely\_\_\_\_ Never\_\_\_\_
16. I believe that most women make too much fuss about the difficulties of childbirth.  
Strongly agree\_\_\_\_ Mildly agree\_\_\_\_ Mildly disagree\_\_\_\_  
Strongly disagree\_\_\_\_
17. I sometimes wish that I weren't going to have this baby.  
Strongly agree\_\_\_\_ Mildly agree\_\_\_\_ Mildly disagree\_\_\_\_  
Strongly disagree\_\_\_\_
18. I worry that my baby may be injured while being born.  
Frequently\_\_\_\_ Occasionally\_\_\_\_ Rarely\_\_\_\_ Never\_\_\_\_
19. I worry that I'll have a hard time during delivery.  
Frequently\_\_\_\_ Occasionally\_\_\_\_ Rarely\_\_\_\_ Never\_\_\_\_
20. I tried to keep from becoming pregnant.  
True\_\_\_\_ False\_\_\_\_
21. I worry about my baby being weak or sickly.  
Frequently\_\_\_\_ Occasionally\_\_\_\_ Rarely\_\_\_\_ Never\_\_\_\_
22. I worry that having a baby will make me less attractive.  
Frequently\_\_\_\_ Occasionally\_\_\_\_ Rarely\_\_\_\_ Never\_\_\_\_
23. This was the wrong time for me to have a baby because of: (Check all reasons that apply to you): My health\_\_\_\_  
Money problems\_\_\_\_ Housing problems\_\_\_\_ I did not want to leave my work\_\_\_\_ My husband or family does not approve\_\_\_\_ I have enough children\_\_\_\_ I'm not ready to settle down\_\_\_\_ It interfered with other plans\_\_\_\_ None of the above\_\_\_\_

24. I have been worried that my baby may be born dead.  
Frequently\_\_\_\_ Occasionally\_\_\_\_ Rarely\_\_\_\_ Never\_\_\_\_
25. I worry that pregnancy and childbirth will ruin my health.  
Frequently\_\_\_\_ Occasionally\_\_\_\_ Rarely\_\_\_\_ Never\_\_\_\_
26. I worry that my baby may be mentally retarded.  
Frequently\_\_\_\_ Occasionally\_\_\_\_ Rarely\_\_\_\_ Never\_\_\_\_
27. It's natural for a woman to worry that she might die  
during childbirth.  
Strongly agree\_\_\_\_ Mildly agree\_\_\_\_ Mildly disagree\_\_\_\_  
Strongly disagree\_\_\_\_
28. A woman should be very careful about what she does  
during pregnancy for fear the baby may be hurt.  
Strongly agree\_\_\_\_ Mildly agree\_\_\_\_ Mildly disagree\_\_\_\_  
Strongly disagree\_\_\_\_

## APPENDIX 2

## Questionnaire # 2

Please answer the following questions.

1. In the last three months of pregnancy, how often did you spend time doing the following?

	very often	often	occa- sion- ally	rarely	never
a. talking about pregnancy?	_____	_____	_____	_____	_____
b. reading about pregnancy?	_____	_____	_____	_____	_____
c. talking about possible problems?	_____	_____	_____	_____	_____
d. talking about the joys of a parent?	_____	_____	_____	_____	_____
e. reading about possible problems?	_____	_____	_____	_____	_____
f. reading about the joys of a parent?	_____	_____	_____	_____	_____
g. talking about birth?	_____	_____	_____	_____	_____
h. reading about birth?	_____	_____	_____	_____	_____
i. reading about difficulties of a parent?	_____	_____	_____	_____	_____
j. talking about difficulties of a parent	_____	_____	_____	_____	_____
k. talking about babies in general?	_____	_____	_____	_____	_____
l. reading about babies in general?	_____	_____	_____	_____	_____
m. talking about caring for your baby?	_____	_____	_____	_____	_____



- |   | very<br>often | often | occa-<br>sion-<br>ally | rarely | never |
|---|---------------|-------|------------------------|--------|-------|
| n. reading about<br>caring for your<br>baby?                                  | _____         | _____ | _____                  | _____  | _____ |
| o. talking about<br>playing with your<br>baby?                                | _____         | _____ | _____                  | _____  | _____ |
| p. reading about<br>playing with your<br>baby?                                | _____         | _____ | _____                  | _____  | _____ |
| q. attending prenatal<br>classes?   | _____         | _____ | _____                  | _____  | _____ |
| r. making prepara-<br>tions for the<br>baby at home (e.g.<br>sleeping place)? | _____         | _____ | _____                  | _____  | _____ |
| s. helping to get the<br>baby's things (e.g.<br>shopping for<br>clothes)?     | _____         | _____ | _____                  | _____  | _____ |
2. If you attended a prenatal course, what kind of course was this? (Lamaze, Health unit, etc.) \_\_\_\_\_
  3. How did your doctor treat you during your prenatal visits?  
very well\_\_\_\_, well\_\_\_\_, average\_\_\_\_, poorly\_\_\_\_,  
very poorly\_\_\_\_\_
  4. How do you feel about your doctor?  
I have a very positive feeling\_\_\_\_, I have a positive  
feeling\_\_\_\_, I have a neutral feeling\_\_\_\_, I have a  
negative feeling\_\_\_\_, I have a very negative feeling\_\_\_\_
  5. Did your doctor: give you much support\_\_\_\_, give you  
limited support\_\_\_\_, give you hardly no support\_\_\_\_,  
give you no support\_\_\_\_\_
  6. Did your doctor discuss different aspects of pregnancy  
with you:  
listening to your viewpoint\_\_\_\_, often telling you his  
viewpoint and listening to your viewpoint\_\_\_\_, giving  
you his viewpoint\_\_\_\_, did not discuss this topic at  
all\_\_\_\_\_

7. When in labour and delivery was the staff helpful?  
not at all helpful\_\_\_\_, somewhat helpful\_\_\_\_, fairly helpful\_\_\_\_, quite helpful\_\_\_\_, very helpful\_\_\_\_
8. When in labour and delivery, how often did the staff offer drugs?  
very often\_\_\_\_, Often\_\_\_\_, occasionally\_\_\_\_, rarely\_\_\_\_, never\_\_\_\_
9. When in labour and delivery, how did the staff react when you were in pain?  
very negatively\_\_\_\_, negatively\_\_\_\_, neutral\_\_\_\_, positively\_\_\_\_, very positively\_\_\_\_
10. When did the doctor arrive?  
**during delivery**\_\_\_\_, **just before delivery**\_\_\_\_, a short while before delivery\_\_\_\_, once during labour and then for delivery\_\_\_\_, twice or more during labour and then for delivery\_\_\_\_
11. Did you hear any screaming from other women in labour?  
very often\_\_\_\_, often\_\_\_\_, occasionally\_\_\_\_, rarely\_\_\_\_, never\_\_\_\_
12. During the labour and delivery of the baby, the father of **the** baby:  
was not present\_\_\_\_, watched only\_\_\_\_, helped a little\_\_\_\_, helped throughout\_\_\_\_, even helped with delivery\_\_\_\_
13. How much information did you have about what to expect from labour and delivery?  
none at all\_\_\_\_, very little\_\_\_\_, some information\_\_\_\_, a great deal\_\_\_\_
14. How different was your experience from your expectations?  
not at all different\_\_\_\_, very little difference\_\_\_\_, some difference\_\_\_\_, a great deal of difference\_\_\_\_
15. Do you feel childbirth was a major experience in your life? Could you tell us about it?  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
16. What was your baby's birth weight? \_\_\_\_\_lbs or \_\_\_\_\_kg.

17. Was there anything you did during labour that helped relieve the pain? (for example: thinking about traveling, shouting, etc.). If yes, could you tell us about this?

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

18. How much pain did you expect to feel?  
 excruciating\_\_\_\_, a great deal\_\_\_\_, some\_\_\_\_, very  
 little\_\_\_\_, none\_\_\_\_
19. How long was your labour (from the time of the first  
 contraction till you went into delivery)?\_\_\_\_\_hrs.

20. What is your date of birth: (day, month, year)\_\_\_\_\_

21. Check the last grade you completed:  
Grade school through high school:   1   2   3   4   5   6  
   7   8   9   10   11   12   13  
College: (at least one year but not a full college course)  
College University: (finished a four year course and  
   got a degree)  
Graduate Degree: (finished a graduate degree).

22. Check the last grade the father completed:  
Grade school through high school: 1    2    3    4    5    6  
   7    8    9    10    11    12    13  
College: (at least one year but not a full college course)  
College University: (finished a four year course and  
   got a degree)  
Graduate Degree: (finished a graduate degree).

23. What is your occupation? \_\_\_\_\_

24. What is the father's occupation?\_\_\_\_\_

25. Where were you born? \_\_\_\_\_  
If in Canada, where were your parents born? Mother: \_\_\_\_\_  
Father: \_\_\_\_\_

26. Are you the type of person who shows pain:  
never , rarely , sometimes , often

Please read each statement and then circle the appropriate number to the right of the statement to indicate how you generally feel. There are no right or wrong answers.

	ALMOST NEVER	SOME- TIMES	OFTEN	ALMOST ALWAYS
27. I feel pleasant.	1	2	3	4
28. I tire quickly.	1	2	3	4
29. I feel like crying.	1	2	3	4
30. I wish I could be as happy as others seem to be.	1	2	3	4
31. I am losing out on things because I can't make up my mind soon enough.	1	2	3	4
32. I feel rested.	1	2	3	4
33. I am "calm, cool, and collected"		2	3	4
34. I feel that difficulties are piling up so that I cannot overcome them.	1	2	3	4
35. I worry too much over something that really doesn't matter.	1	2	3	4
36. I am happy.	1	2	3	4
37. I am inclined to take things hard.	1	2	3	4
38. I lack self-confidence	1	2	3	4
39. I feel secure.	1	2	3	4
40. I try to avoid facing a crisis or difficulty.	1	2	3	4
41. I feel blue.	1	2	3	4
42. I am content.	1	2	3	4
43. Some unimportant thought runs through my mind and bothers me.	1	2	3	4
44. I take disappointments so keenly that I can't put them out of my mind.	1	2	3	4

	ALMOST NEVER	SOME- TIMES	OFTEN	ALMOST ALWAYS
45. I am a steady person.	1	2	3	4
46. I get in a state of tension or turmoil as I think over my recent concerns and interests.	1	2	3	4

Please read the following statements and try and decide whether "Yes" or "No" represents your usual way of acting or feeling. Then circle the word "Yes" or the word "No". Remember to give YOUR OWN opinion of yourself. Do not leave any blank spaces if you can avoid it.

- |  |     |    |
|--|-----|----|
| 47. Do you <b>often</b> long for excitement?                                 | Yes | No |
| 48. Are you usually carefree?  | Yes | No |
| 49. Do you stop and think things over before doing anything?                 | Yes | No |
| 50. Do you generally do and say things quickly without stopping to think?    | Yes | No |
| 51. Would you do almost anything for a dare?                                 | Yes | No |
| 52. Do you often do things on the spur of the moment?                        | Yes | No |
| 53. Generally do you prefer reading to meeting people?                       | Yes | No |
| 54. Do you like going out a lot?   | Yes | No |
| 55. Do you prefer to have few but special friends?                           | Yes | No |
| 56. When people shout at you, do you shout back?                             | Yes | No |
| 57. Can you usually let yourself go and enjoy yourself a lot at a gay party? | Yes | No |
| 58. Do other people think of you as being very lively?                       | Yes | No |
| 59. Are you mostly quiet when you are with other people?                     | Yes | No |

60. If there is something you want to know about, would you rather look it up in a book than talk to someone about it? Yes No
61. Do you like the kind of work that you need to pay close attention to? Yes No
62. Do you hate being with a crowd who play jokes on one another? Yes No
63. Do you like doing things in which you have to act quickly? Yes No
64. Are you slow and unhurried in the way you move? Yes No
65. Do you like talking to people so much that you would never miss a chance of talking to a stranger? Yes No
66. Would you be very unhappy if you could not see lots of people most of the time? Yes No
67. Would you say you were fairly self confident? Yes No
68. Do you find it hard to really enjoy yourself at a lively party? Yes No
69. Can you easily get some life into a rather dull party? Yes No
70. Do you like playing pranks on others? Yes No

Please read the following sets of statements, and indicate by circling a or b, which one of each set is TRUE in your opinion.

Remember to give YOUR OWN opinion of yourself. Do not leave any blank spaces if you can avoid it.

71. a. Many of the painful experiences in people's lives are partly due to bad luck.
- b. People's pain results from the mistakes they make.
72. a. One of the major reasons why we have so much sickness is because people don't take enough interest in medicine.
- b. There will always be sickness no matter how hard people try to prevent it.

73. a. In the long run people get the relief from pain they deserve.
- b. Unfortunately an individual's pain often passes unrecognized no matter how hard he tries to communicate it.
74. a. The idea that doctors are careless is nonsense.
- b. Most patients don't realize the extent to which their operations are influenced by accidental happenings.
75. a. Without the right breaks one cannot have an easy labour.
- b. Capable women who fail to have an easy labour have not taken advantage of their opportunities.
76. a. No matter how hard you try you cannot eliminate the experience of pain.
- b. People who can't conquer their pain don't understand what pain is all about.
77. a. I have often found that what is going to be painful, will be painful.
- b. Trusting to fate to remove the pain, has never turned out as well for me as making a decision to take a definite course of action.
78. a. In the case of the well prepared woman, there is rarely, if ever, such a thing as an extremely hard and painful labour.
- b. Many times labor pains and complications tend to be so unrelated to expectations that preparation is useless.
79. a. Overcoming pain is a matter of hard work, luck has little or nothing to do with it.
- b. Relief from pain depends mainly on having the right doctor and getting the right drug.
80. a. Any person can have an influence on his own operation.
- b. The hospital is run by the few people in power, and there is not much the regular person can do about it.

81. a. When I think of how to overcome a painful experience, I am almost certain I will succeed.
- b. It is not always wise to plan such events because many things turn out to be a matter of good or bad fortune anyhow.
82. a. In my case enduring pain has little or nothing to do with luck.
- b. Many times we might just as well predict how we will react in pain, by flipping a coin.
83. a. When I am in pain I want the doctor to take care of me and relieve me of the pain.
- b. When in pain I let the doctor cure the disease and try to control the pain myself.
84. a. As far as illness is concerned, most of us are the victims of forces we can neither understand, nor control.
- b. By taking an active part in getting to know our own body, people can control illnesses.
85. a. Most people don't realize the extent to which their painful experiences are controlled by accidental happenings.
- b. There really is no such thing as "luck".
86. a. With enough effort we can cure most sicknesses.
- b. It is difficult for people to have much control over the elements.
87. a. Sometimes I can't understand how the same operations cause different degrees of pain.
- b. There is a direct connection between how hard I try to control myself and the pain, and the degree of pain I experience.
88. a. Many times I feel that I have little influence over painful experiences.
- b. It is impossible for me to believe that chance or luck plays an important role in pain.
89. a. What happens to me in the labor room is my own doing.
- b. At times I feel that I won't have enough control over the direction my labor is taking.



90. a. Most of the time I can't understand why nurses behave the way they do.
- b. In the long run the people are responsible for bad treatment from nurses.

## APPENDIX 3

There were two different forms for the doctor. The form that was given to the doctors at St. Michaels hospital is on page 97. The form that was given to the women who volunteered through their prenatal class, to give to their doctor is on page 98. Two different forms were necessary since the doctors at St. Michaels hospital gave out the questionnaires, and instructions as to which questionnaire should be given when was included in their form.

Dear Doctor:

Your decision to cooperate in this research is greatly appreciated. With your help we will be able to discover the various variables influencing the pain of labour. This will help us, in the future, to prepare women for childbirth.

Questionnaire #1 should be given to the women who agree to participate and sign the information sheet. They should be asked to fill it out after they have finished their last prenatal class (if they are attending one), or in their third trimester (if not attending a prenatal class). The completed questionnaire should be attached to their prenatal record and kept in the hospital, so we may be called in when the woman goes into labour. The following questionnaire should be filled in by you after delivery.

We will be administering a short (5-10 min.) pain questionnaire during the transition stage of labour and a short questionnaire a few days after delivery.

Thank you for your cooperation,

Helene Wallach, MA Candidate,  
Lakehead University

Patient's Name \_\_\_\_\_

Please check which of the following complications occurred during labour or delivery:

- ☐ severe eclampsia or preeclampsia
- ☐ mild preeclampsia or other hypertension
- ☐ action (other than just watching) for fetal distress
- ☐ some concern for fetal distress
- ☐ placenta previa
- ☐ abruptio
- ☐ prolapsed cord
- ☐ postpartum hemorrhage
- ☐ 2nd stage arrest
- ☐ multiple birth
- ☐ prematurity
- ☐ postmaturity
- ☐ prolonged latent stage
- ☐ birth weight over 4.9 kg
- ☐ none of the above

Medication received in labour: type\_\_\_\_\_ dosage\_\_\_\_\_ time\_\_\_\_\_

type\_\_\_\_\_ dosage\_\_\_\_\_ time\_\_\_\_\_

type\_\_\_\_\_ dosage\_\_\_\_\_ time\_\_\_\_\_

Dear Doctor:

Your decision to cooperate in this research is greatly appreciated. With your help we will be able to discover the various variables influencing the pain of labour. This will help us, in the future, to prepare women for childbirth. The following questionnaire should be filled in by you after delivery.

Thank you for your cooperation,

Helene Wallach, MA Candidate  
(Lakehead University)

Patient's Name \_\_\_\_\_

Please check which of the following complications occurred during labour or delivery:

- \_\_\_\_\_ severe eclampsia or preeclampsia
- \_\_\_\_\_ mild preeclampsia or other hypertension
- \_\_\_\_\_ action (other than just watching) for fetal distress
- \_\_\_\_\_ some concern for fetal distress
- \_\_\_\_\_ placenta previa
- \_\_\_\_\_ abruptio
- \_\_\_\_\_ prolapsed cord
- \_\_\_\_\_ postpartum hemorrhage
- \_\_\_\_\_ 2nd stage arrest
- \_\_\_\_\_ multiple birth
- \_\_\_\_\_ prematurity
- \_\_\_\_\_ postmaturity
- \_\_\_\_\_ prolonged latent stage
- \_\_\_\_\_ birth weight over 4.9 kg
- \_\_\_\_\_ none of the above

Medication received in labour: type \_\_\_\_\_ dosage \_\_\_\_\_ time \_\_\_\_\_  
 type \_\_\_\_\_ dosage \_\_\_\_\_ time \_\_\_\_\_  
 type \_\_\_\_\_ dosage \_\_\_\_\_ time \_\_\_\_\_

## APPENDIX 4

Analgesics (if already administered):

1. Type\_\_\_\_\_
2. Dosage\_\_\_\_\_
3. Time given in relation to this test\_\_\_\_\_

The questionnaire has been designed to tell us more about your pain. Two major questions we ask are:

1. What does your pain feel like?
2. How strong is it?

It is important that you tell us how your pain felt **during** labour. Please follow the instructions at the begining of each part.

Part 1: What does your pain feel like?

Some of the words below describe your **pain during transition**. Circle ONLY those words that best describe it. Leave out any category that is not suitable. Use only a single word in each appropriate category - the one that applies best.

1	2	3	4	5
Flickering	Jumping	Pricking	Sharp	Pinching
Quivering	Flashing	Boring	Cutting	<b>Pressing</b>
Pulsing	Shooting	Drilling	Lacerating	<b>Gnawing</b>
Throbbing		Stabbing		Cramping
Beating		Lancinating		Crushing
Pounding				
6	7	8	9	10
Tugging	Hot	Tingling	Dull	Tender
Pulling	Burning	Itchy	Sore	Taut
Wrenching	Scalding	Smarting	Hurting	Rasping
	Searing	Stinging	Aching	Splitting
			Heavy	

11	12	13	14	15
Tiring	Sickening	Fearful	Punishing	Wretched
Exhausting	Suffocating	Frightful	Gruelling	Blinding
		Terrifying	Cruel	
			Vicious	
			Killing	
16	17	18	19	20
Annoying	Spreading	Tight	Cool	Nagging
Troublesome	Radiating	Numb	Cold	Nauseating
Miserable	Penetrating	Drawing	Freezing	Agonizing
Intense	Piercing	Squeezing		Dreadful
Unbearable		Tearing		Torturing

Part 2: How strong is it?

NO PAIN  
AT ALL

MY PAIN IS AS BAD AS  
IT COULD POSSIBLY BE

My pain at its worst was:

very severe pain\_\_\_\_, severe pain\_\_\_\_, average pain\_\_\_\_,  
mild pain\_\_\_\_, very mild pain\_\_\_\_



## APPENDIX 5

## LAKEHEAD UNIVERSITY

INFORMATION SHEET

The study you are being asked to participate in deals with the degree of pain felt in labour as a result of the contractions.

As you probably know - no two women have the same level of pain, just as no two people have the same pain from surgery, wounds, etc. Your pain may very well be quite different from that of your friend's, mother's or sister's pain.

The causes for the differences in pain are many. The intention of this study is to discover which of these reasons are important. Once we know this we will be better able to prepare women for labour pain.

In the course of the study you will be asked to rate your pain, to describe it and to answer two questionnaires. The pain ratings and the second questionnaire will be given to you to fill out several days after delivery. The first questionnaire will be given to you to fill out in the third trimester of your pregnancy (7-9 months) or after the last prenatal class (if you are attending one).

Your participation in this study is purely on a voluntary basis, and you may leave the study at any time. If you are willing to participate, we would greatly appreciate it.

Your responses will be confidential. The questionnaire you will fill out before delivery will take about 30 minutes, and the one you will answer after delivery will also take about 30 minutes.

If you are willing to participate, please sign below.

WISHING YOU AN EASY LABOUR AND DELIVERY

---

Helene Wallach  
MA Candidate  
Lakehead University

Signature of Participant

---

## APPENDIX 6

### Results of Factor Analysis

The factor analysis was used solely to be able to isolate those items which loaded together on the main factor of the scales in question, and therefore the analysis was limited to one factor, and was performed on all the women together.

Factor analysis was conducted on: amount of prenatal preparation, doctor-patient rapport, hospital situation, complications of labor, and locus of control. The results are presented in **tables 7, 8, 9, 10, and 11.**

Table 7

Factor Analysis Results for Amount of Prenatal  
Preparation

Questionnaire item number	Principal factor	Factor score coefficients
1	0.35	0.06
2	0.44	0.07
3	0.34	0.05
4	0.44	0.07
5	0.52	0.08
6	0.69	0.11
7	0.57	0.09
8	0.71	0.11
9	0.65	0.10
10	0.64	0.10
11	0.54	0.09
12	0.78	0.12
13	0.60	0.10
14	0.73	0.12
15	0.67	0.11
16	0.69	0.11
17	0.26	0.04
18	0.54	0.08
19	0.47	0.07

Table 8

## Factor Analysis Results for Doctor-Patient Rapport

Questionnaire item number	Principal factor	Factor score coefficient
1	0.90	0.32
2	0.92	0.33
3	0.90	0.32
4	0.55	0.20

Table 9

## Factor Analysis Results for Hospital Situation

Questionnaire item number	Principal factor	Factor score coefficient
1	0.85	0.44
2	0.27	0.14
3	0.84	0.44
4	0.56	0.29
5	0.34	0.18

Table 10

Factor Analysis Results for Complications  
of Labor<sup>a</sup>

Questionnaire item number	Principal factor	Factor score coefficient
1	0.56	0.28
2	-0.05	-0.23
3	-0.17	-0.09
4	-0.09	-0.05
5	-0.19	-0.10
6	-0.31	0.16
7	0.73	0.37
8	0.59	0.30
9	0.77	0.39

<sup>a</sup>Five complications (item nos. 10-14) were not encountered by any of the subjects, and therefore do not appear in this table.



Table 11

## Factor Analysis Results for Locus of Control

Questionnaire item number	Principal factor	Factor score coefficient
1	0.12	0.03
2	0.20	0.06
3	0.04	0.01
4	0.10	0.03
5	0.28	0.08
6	0.52	0.15
7	0.32	0.09
8	0.10	0.03
9	0.54	0.16
10	0.15	0.04
11	0.65	0.19
12	0.42	0.12
13	0.62	0.18
14	0.53	0.16
15	0.44	0.13
16	0.56	0.16
17	0.58	0.17
18	0.59	0.17
19	0.33	0.10
20	0.17	0.05

## APPENDIX 7

Table 12

The Correlation Between Dependent Pain Variables  
and Independent Variables in the All Women Group

Variable	Pain #1	Pain #2	Pain #3 Sensory	Pain #3 Affec- tive	Pain #3 Eval- uative	Pain #3 Total
Age	-0.008	-0.163	-0.005	-0.054	0.053	-0.140
Socio- economic status	-0.049	-0.058	-0.080	-0.025	0.015	-0.055
Culture	-0.086	-0.212	-0.117	0.037	0.081	-0.151
Anxiety	0.071	0.027	-0.035	0.174	0.165	0.096
General reaction to pain	-0.003	-0.008	0.091	0.067	0.033	0.015
Extrover- sion	0.043	0.194	-0.011	0.255	-0.160	0.225
Locus of control	0.152	0.046	0.111	0.206	0.194	0.110
Doctor- patient rapport	0.044	-0.045	0.101	-0.052	-0.061	-0.062
Amount of prenatal prepara- tion	0.007	0.224	0.199	0.068	-0.087	0.184
Type of prenatal prepara- tion	-0.049	-0.107	-0.001	-0.130	0.031	-0.116
Fears for self	0.162	0.081	0.131	0.308	0.180	0.177
Fears for baby	0.154	0.173	0.110	0.282	0.110	0.228
Lack of desire for pregnancy	0.031	0.094	-0.010	0.137	0.020	0.121

Table 12 (cont'd)

Variable	Pain #1	Pain #2	Pain #3 Sensory	Pain #3 Affec- tive	Pain #3 Eval- uative	Pain #3 Total
Hospital situation	0.083	0.171	0.100	0.136	-0.002	0.171
Presence of father	0.026	0.104	0.098	0.179	0.019	0.134
Amount of informa- tion about what to expect	0.006	-0.013	-0.010	-0.083	-0.046	-0.036
Length of labour	0.161	0.023	0.072	0.122	0.211	0.069
Complica- tions	0.088	0.108	0.077	0.204	0.006	0.114
Medication	0.142	0.087	0.090	0.172	0.113	0.131
Epidural	-0.049	0.026	0.092	0.032	0.028	0.072
Length of painful labour	0.137	0.056	-0.002	0.106	0.209	0.044
Number of doctors	-0.123	-0.052	-0.007	-0.057	-0.194	-0.043
Cognitive control strate- gies	-0.081	-0.181	0.088	-0.052	-0.130	0.041
Amount of pain expected	-0.188	-0.037	-0.078	0.048	-0.123	-0.051
Amount of informa- tion about what to expect	1 -0.167	-0.163	-0.001	-0.161	-0.094	-0.063
	2 0.068	0.022	0.083	0.065	-0.035	0.086

Table 13

The Correlation Between Dependent Pain Variables and  
Independent Variables in the No-Epidural Group

Variable	Pain #1	Pain #2	Pain #3 Sensory	Pain #3 Affec- tive	Pain #3 Eval uative	Pain #3 Total
Age	0.005	0.118	-0.101	0.013	0.100	-0.066
Socio- economic status	-0.177	-0.141	-0.068	-0.004	-0.020	-0.057
Culture	-0.081	-0.090	-0.162	0.072	0.045	-0.100
Anxiety	0.075	0.039	-0.030	0.214	0.207	0.065
General reaction to pain	0.204	0.133	0.065	0.204	0.209	0.136
Extrover- sion	0.083	0.074	0.161	0.266	-0.139	0.197
Locus of control	0.070	0.021	0.019	0.208	0.196	0.100
Doctor- patient rapport	0.001	0.101	-0.059	-0.060	-0.125	-0.078
Amount of prenatal prepara- tion	0.138	0.170	0.242	0.034	-0.129	0.188
Type of prenatal prepara- tion	-0.084	-0.050	-0.070	-0.124	0.057	-0.089
Fears for self	0.169	0.126	-0.028	0.257	0.247	0.084
Fears for baby	0.063	-0.021	0.024	0.218	-0.067	0.081
Lack of desire for pregnancy	-0.028	-0.028	0.168	0.177	0.117	0.200

Table 13 (cont'd)

Variable	Pain #1	Pain #2	Pain #3 Sensory	Pain #3 Affec- tive	Pain #3 Eval- uative	Pain #3 Total
Hospital situation	0.039	0.131	0.096	0.177	0.049	0.137
Presence of father	-0.048	-0.018	0.106	0.180	-0.110	0.129
Amount of informa- tion about what to expect	0.036	0.004	0.062	-0.014	-0.077	0.037
Length of labour	0.107	-0.010	-0.068	-0.025	0.139	-0.047
Complica- tions	0.156	0.215	0.129	0.266	-0.061	0.179
Medication	0.156	0.050	0.153	0.183	0.119	0.194
Epidural	0.300	0.266	0.269	0.107	0.007	0.246
Length of painful labour	0.106	-0.009	-0.070	-0.024	0.141	-0.048
Number of doctors	-0.118	-0.004	0.102	-0.050	-0.159	0.049
Cognitive control strate- gies	0.033	-0.177	0.115	-0.122	-0.156	0.036
Amount of pain expected	-0.135	0.000	-0.127	0.198	0.015	-0.036
Amount of informa- tion about what to expect	1 -0.205	-0.187	-0.153	-0.427	-0.078	-0.263
	2 0.124	0.080	0.133	0.155	-0.058	0.148

Table 14

The Correlation Between Dependent Pain Variables and  
Independent Variables in the Epidural Group

Variable	Pain #1	Pain #2	Pain #3 Sensory	Pain #3 Affec- tive	Pain #3 Eval uative	Pain #3 Total
Age	0.013	-0.151	-0.231	-0.152	0.026	-0.226
Socio-economic status	0.076	-0.014	-0.042	-0.056	0.047	-0.051
Culture	-0.098	-0.143	-0.260	0.001	0.148	-0.199
Anxiety	0.070	-0.133	0.113	0.100	0.130	0.137
General reaction to pain	-0.236	0.046	-0.116	-0.162	-0.138	-0.160
Extrover- sion	0.004	-0.104	0.244	0.242	-0.185	0.264
Locus of control	0.257	0.222	0.067	0.193	0.200	0.107
Doctor- patient rapport	0.135	0.102	-0.075	-0.071	0.000	-0.086
Amount of prenatal prepara- tion	-0.103	0.046	0.188	0.104	-0.064	0.167
Type of prenatal prepara- tion	-0.003	0.124	-0.128	-0.114	0.032	-0.122
Fears for self	0.163	0.129	0.214	0.378	0.114	0.284
Fears for baby	0.259	0.260	0.385	0.379	0.279	0.427
Lack of desire for pregnancy	0.091	0.009	-0.017	0.074	-0.069	0.010

Table 14 (cont'd)

Variable	Pain #1	Pain #2	Pain #3 Sensory	Pain #3 Affec- tive	Pain #3 Eval- uative	Pain #3 Total
Hospital situation	0.028	-0.154	0.203	0.138	-0.127	0.171
Presence of of father	0.133	0.271	0.078	0.168	0.172	0.126
Amount of informa- tion about what to expect	-0.038	-0.020	-0.134	-0.218	0.000	-0.150
Length of labour	0.248	0.187	0.164	0.403	0.312	0.252
Complica- tions	-0.035	-0.099	0.007	0.078	0.188	0.014
Medication	0.187	0.268	-0.036	0.232	0.207	0.046
Epidural	-0.358	-0.238	-0.316	-0.236	-0.095	-0.335
Length of painful labour	0.186	0.153	0.129	0.367	0.312	0.213
Number of doctors	-0.129	-0.106	-0.165	-0.068	-0.232	-0.170
Cognitive control strate- gies	-0.210	-0.195	0.053	0.067	-0.109	0.122
Amount of pain expected	-0.274	-0.098	0.001	-0.260	-0.304	0.014
Amount of informa- tion about what to expect	1 -0.148	-0.142	0.161	0.080	-0.094	0.054
	2 -0.033	0.032	-0.087	0.000	-0.123	-0.090



Questions measuring fear for self, fear for baby and lack of desire for pregnancy were given to the women to fill out before delivery. However, in some cases this questionnaire was lost, or the woman forgot to fill it out before delivery. In these cases it was filled out afterwards. Since these variables may have been influenced by the delivery, these two groups of women were compared. Table 15 compares the variances of both groups. If the variances are different (F value significant), it is not possible to pool the groups and therefore must use  $t$  unpooled. If F is not significant, the variances are not different and therefore it is possible to pool the groups and use the pooled  $t$  test. As can be seen in the table, the variance is significantly different for fear for self and fear for baby but not for lack of desire for pregnancy. Therefore  $t$  pooled is used for the first two variables and  $t$  unpooled for the last one. The  $t$ 's are insignificant except for the fear for baby variable and then is is significant at 0.05 and not at 0.01.

## APPENDIX 8

Table 15

Comparison Between Women Who Filled Out the Attitude  
to Pregnancy Questionnaire Before Delivery to  
Those Who Filled it Out After Delivery

Variable and group	Num ber of ca- ses	Mean	Stan dard de- via- tion	F va- lue	Two tail pro- ba- bi- lity	Pooled t	variance df	variance two tail	Separate t	variance df	variance two tail
Fear for self											
Before	91	22.10	4.47								
After	37	23.14	4.22	1.12	0.72	-1.21	126	0.23	-1.24	70	0.22
Fear for baby											
Before	91	23.47	4.61								
After	37	25.35	4.72	1.05	0.83	-2.08	126	0.04	-2.05	65	0.04
Lack of desire for pregnancy											
Before	91	9.92	3.81								
After	37	11.59	5.76	2.28	0.00	-1.92	126	0.06	-1.63	49	0.11